

# The Spiders of the Family Symphytognathidae

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## Abstract

THE status of the families Symphytognathidae, Anapidae, Tetraxellidae and Micropholcommatidae and the genera *Mysmena* and *Lucharachne* is discussed, and it is proposed to group all of these spiders into a single family for which the earliest name is Symphytognathidae. The affinities of the family are discussed, and it is concluded that it was derived from the Argiopidae, and it is suggested that the resemblance which some genera show with the Theridiidae in structure and habits is the result of convergence. The web, where it is known, indicates that the basic structure is an orbweb, but that in a number of species this has been modified to give the appearance of webs typical for the Theridiidae and Linyphiidae. New records are given for a number of previously described species, and two new genera and twenty-eight new species are established. The structure of the respiratory system within the family is discussed, and it is concluded that the different systems represented have at the most generic significance.

## INTRODUCTION

THE spiders included in the Symphytognathidae are all minute, ranging in body length from about 0.5 mm to 2.00 mm. Because of their small size and the cryptozoic life they lead in leafmould and moss, they have been rarely found in the past and are generally poorly represented in collections. However, over the last few decades sufficient numbers of these spiders have been collected and recognised to permit more conclusive studies to be made. Most of the specimens recorded in the present paper have been obtained over the last ten years from leafmould and moss by the use of Salmon's modification of the Berlese Funnel.

The family Symphytognathidae was established by Dr. V. V. Hickman in 1931 for the minute Tasmanian spider *Symphytognatha globosa*. The family was based on a number of unusual characters, of which the most important were the absence of lungbooks, the anterior spiracles leading into tracheae, the absence of female palps, and the fusion of the chelicerae along the midline. Petrunkevitch (1933) in his monumental study on the classification of spiders based on a study of their internal anatomy, pointed out that, in addition to the lack of lungbooks, the Symphytognathidae shared a number of internal characters with the Leptonetidae and Caponiidae, and he therefore placed these three families in a separate sub-order, the Apneumonomorphae. Fage (1937), after examining the respiratory system of a number of the spiders placed by Simon (1895) in the group Anapeae (Argiopidae), pointed out that all of the genera in this group which he was able to examine, with the exception of *Tecmessa*, were without lungbooks and should be in his opinion placed in the family Symphytognathidae, and he suppressed the family Anapidae established two years earlier by Kratochvil (1935) for these spiders. This conclusion has been followed by all subsequent authors.

Hickman, in the course of his series of papers on the spiders of Tasmania, established two further families of apneumone spiders, Micropholcommatidae (1944) and Tetraxellidae (1945), which he placed in the sub-order Apneumonomorphae with the Symphytognathidae, Telemidae and Caponiidae.

After studying the large series of spiders now available from New Zealand, Australia, New Guinea and the Pacific Islands, and the collection of these spiders from North and South America in the American Museum of Natural History, New York, I have concluded that the families Symphytognathidae, Micropholcommatidae and Tetracellidae, with the genera *Mysmena* and *Lucharachne* could well be placed in a single family, for which the oldest available name is the Symphytognathidae.

In spite of our increasing knowledge of the structure and habits of these spiders the relationship of this family to other spiders still remains in doubt. The genera included in the wider interpretation of the family adopted in this paper could be grouped equally well on morphological grounds to demonstrate close affinity with either the Argiopidae or the Therididae. Opinion in the past has been divided in the main between these two alternatives. Simon (1895) placed his group Anapeae at the end of the Argiopidae, indicating affinity with the orbweb spiders, while Berland (1924) considered that the group should be placed in the Therididae. I'age (1937), while following Simon's placing of the group, pointed out that only future study would resolve the question of whether the family had evolved directly from either the Argiopidae or Therididae or originated from stock common to both of these families. I am inclined to the view that the family has been derived from the Argiopidae or at least has evolved from a stock common with the Argiopidae. The fact that a number of genera construct typical orbwebs—*Risdonius* (Hickman, 1938), *Chasmocephalon* (Hickman, 1946), *Patu* (Marples, 1956)—in my opinion strongly supports this view. It is most difficult to conceive the separate development of an orbweb in a form identical with that of typical argiopid spiders, whereas degeneration from an orbweb could easily lead to webs having the appearance of sheet or tangle webs. *Tetracella* constructs small sheet webs which look like those of the Micryphantidae while the webs of *Micropholcomma* are tangle webs such as are found in the Therididae. Archer (1946) reports that North American species of *Mysmena* constructs a sheet web, but the statement made by Marples (1955) after carefully studying *Tamasesia acuminata*, a species which is transferred to *Mysmena* in the present paper, seems significant. He states "The web is extremely delicate. It consists of a set of threads radiating in all directions from a centre where the spider sits. The space between the radials is filled with the threads of sticky silk, so fine that the droplets can only be seen under the microscope, and the whole occupies a volume roughly 1.5–2 cm across. When spinning the spider keeps going quickly out along different radials. Apparently it attaches a thread to a radial and carries the other end to the centre and out along another radial to attach it there. The web is built from the periphery inwards. Though the threads are not regularly arranged, the general impression is of an orb web in three dimensions." If we were attempting to bridge the gap between the typical orbwebs found in *Chasmocephalon*, *Risdonius* and *Patu* and the type of web found in *Micropholcomma*, the web of *Mysmena acuminata* provides a perfect example. With only slight modification this type of web would lose all resemblance to an orbweb, and would then be in the form found in *Micropholcomma*. With reference to the development of a sheet web from an orbweb, I might quote Marples' (1951) reference to the web of *Patu samoensis*, where he states "They consisted of a very fine horizontal sheet with very regular meshes. The sheet was an irregular polygon some six centimetres long, and an oblique thread extended upwards from the sheet between one and two centimetres from one end. The threads of the sheet radiated from a point of attachment of the oblique thread, but it was a sheet and not an orb web." Later observations, however (Marples, 1955) demonstrated that this web is initially an orbweb of very fine mesh, and that subsequent tangling of the threads or the addition of further threads gives it the appearance of a sheet web. During a brief stay in Fiji in 1956 I was able to examine the web of the very closely related species *Patu vitiensis*. The webs, which are from 3 to 5 centimetres in width, were on tree trunks, where they were placed horizontally. The threads were extremely fine and

closely spaced, but after treatment with talc the web was found to be a perfect orb, with the sticky spiral lines closely spaced, and it does not appear that in this species the regular structure is subsequently modified as in *samoensis*.

*Symphytognatha* is reported by Hickman (1931) to construct an irregular web like that of *Theridion*, in which the spider rests in an inverted position. In view of the very close morphological relationship of this genus to *Patu* it would be of considerable interest if the method of web construction were to be closely studied to see if there is any evidence for this web being a degenerate orbweb

#### ACKNOWLEDGMENTS

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#### Family SYMPHYTOGNATHIDAE Hickman 1931

- 1931 Symphytognathidae Hickman Proc Zool Soc London p 1328
- 1935 Anapidae Kratochvil Act Soc Sc Natur Moraviae, 9 (12)
- 1944 Micropholcommatidae Hickman Pap Proc Roy Soc Tasman p 183
- 1945 Tetricellidae Hickman Trans Conn Acad Arts Sc 36, p 136
- 1956 Tamasesidae Marples J Linn Soc Zool 42 (287), p 476

Cribellum and calamistrum wanting. Colulus present (except in *Symphytognatha* and *Patu*). Six spinnerets. Lungbooks usually wanting, when present somewhat atypical in form. Anterior spiracle usually leading into tracheal tubes which sometimes supply both abdomen and cephalothorax, but often only abdomen. Two posterior spiracles, one or none. Posterior spiracles when present supplying tracheal tubes to abdomen only, both abdomen and cephalothorax or cephalothorax only. Eight eyes, six eyes or four eyes. Lateral eyes always contiguous. Carapace usually high. Clypeus high, vertical. Labium fused, Maxillae converging. Palp in female without claw, often reduced in length and in the number of segments, sometimes completely absent. Legs prograde, without spines (except secondary spines on legs of males) or scopulae. Claw tufts wanting. Tarsus longer than metatarsus. Tarsal drum present. Three claws. Trichobothria few, two or three on tibia, one on metatarsi of first three legs, none elsewhere. Type genus *Symphytognatha* Hickman 1931.

The Symphytognathidae as defined above presents a number of characters which clearly separate it from other families. The relative lengths of the tarsus and metatarsus are very characteristic. The tarsus is usually much longer than the metatarsus, which is the reverse of the situation in practically all other spiders. In a few forms which I have included in this family (*Mysmena*) at least one pair of legs shows this character, while the lengths of these segments in other legs is subequal. *Pholcomma*, a genus usually placed in the Theridiidae, also shows this character to a less marked degree, but possesses a claw on the female pedipalp. I have not placed this genus into the Symphytognathidae although it possesses a number of other characters which might justify this action. An examination of a New Zealand species of *Pholcomma* shows that the lungbooks are normal. Levi (1956) recently

established a genus *Archerus* for a North American spider in which the tarsi are longer than the metatarsi and which possessed other characters which indicate that it could probably be placed within the Symphytognathidae. All of these spiders possess a tarsal drum, but until this structure is specifically looked for over a wider range of spiders it is not known how much significance it has in phylogeny. The loss of the claw from the female pedipalp seems to be common to all genera, while there is also a tendency to a reduction in the length and number of segments culminating in the complete loss of this appendage in several genera.

The original number of eyes must have been eight, but there is a tendency for the anterior median eyes to be reduced in size or absent, and in one genus the posterior median eyes are also absent (*Anapistula* Gertsch). In four genera (*Pseudanapis* and *Anapistula*, *Textricella* and *Pseudanapis*) I have grouped together spiders with different numbers of eyes where other characters have indicated a close relationship. The lateral eyes in all genera are contiguous, and except in *Mysmena* are well separated from the median eyes.

The carapace of both males and females is usually elevated, and this is probably a primitive family character. In *Anapistula*, however, the carapace is not conspicuously elevated, while in *Mysmena* it appears as a dimorphic character shown only in the males. I consider that this represents a regression rather than an indication that the elevated form has been developed within the family. The presence of an elevated carapace in both sexes is of considerable interest and represents a condition fundamentally different from that found in other families (Argiopidae including *Landana*, *Therididae*, *Linyphidae*, *Micryphantidae*) where only the male possesses this character. The only other family which does possess this character in the same form is the Archaeidae, which shares other characters with the Symphytognathidae and in my view is closely related to it.

The respiratory system of these spiders is discussed at greater length elsewhere in this paper, but it is evident that the ancestral forms of this family must have possessed two anterior spiracles leading into lungbooks and two posterior spiracles leading into tracheae. Within the family there is great variation in the form of the respiratory system, and it appears evident that this variation is at the most of generic significance.

## LIST OF GENERA AND SPECIES

### SYMPHYTOGNATHA Hickman 1931

Type Species *Symphytognatha globosa* Hickman 1931 (Tasmania)

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### PATU Marples 1951

Type Species *Patu vitensis* Marples 1951 (Fiji)

*Patu samoensis* Marples 1951 (Samoa)

*Patu marplesi* n sp (Samoa)

*Patu woodwardi* n sp (New Guinea)

### ANAPISTULA Gertsch 1941

Type Species *Anapistula secreta* Gertsch 1941 (Panama)

*Anapistula boneti* Forster 1958 (Mexico)

*Anapistula australia* n sp (Australia)

### ANAPIS Simon 1895

Type Species *Anapis hetschkii* (Keyserling) 1883 (Brazil)

*Anapis hamigera* Simon 1897 St Vincent (Venezuela)

*Anapis keyserlingi* Gertsch 1941 (Panama)

*Anapis mexicana* Forster 1958 (Mexico)

## ANAPOGONIA Simon 1905

Type Species *Anapogonia lyrata* Simon 1905 (Java)

## EPECTHINULA Simon 1903

Type Species *Epecthinula minutissima* Simon 1903 (Jamaica)

## CHASMOCEPHALON Cambridge 1889

Type Species *Chasmocephalon neglectum* Cambridge 1889 (West Australia)

*Chasmocephalon minutum* Hickman 1944 (Tasmania)

*Chasmocephalon armatum* Forster 1944 (New Zealand)

## CROZETULUS Hickman 1939

Type Species *Crozetulus minutus* Hickman 1939 (Crozet Is )

## PSEUDANAPIS Simon 1905

Type Species *Pseudanapis paroculus* (Simon) 1899 (Sumatra, Java)

*Pseudanapis relicta* Kratochvil 1935 (Dalmatia)

*Pseudanapis algerica* Simon (Algeria)

*Pseudanapis insolitus* Berland 1924 (New Caledonia)

*Pseudanapis burra* n sp (Australia)

*Pseudanapis octocula* n sp (Australia)

*Pseudanapis darlingtoni* n sp (Australia)

*Pseudanapis grossa* n sp (New Guinea)

*Pseudanapis wilsoni* n sp (New Guinea)

*Pseudanapis aloha* n sp (Hawaii)

*Pseudanapis spinipes* (Forster) 1951 (New Zealand)

*Pseudanapis insula* (Forster) 1951 (New Zealand)

## RISDONIUS Hickman 1939

Type Species *Risdonius parvus* Hickman 1939 (Tasmania)

*Risdonius conicus* (Forster) 1951 (New Zealand)

## ANAPISONA Gertsch 1941

Type Species *Anapisona simoni* Gertsch 1941 (Panama)

*Anapisona gertschi* Forster 1958 (Mexico)

*Anapisona kartabo* Forster 1958 (British Guiana)

## MYSMENA Simon 1894

Type Species *Mysmena leucoplagiata* (Simon) 1879 (France)

*Mysmena conica* Simon 1894 (Algeria)

*Mysmena guttata* (Banks) 1895 (United States)

*Mysmena cymbia* Levi 1956 (Florida)

*Mysmena incredula* (Gertsch and Davis) 1936 (Southern United States, central America)

*Mysmena guianaensis* Levi 1956 (British Guiana)

*Mysmena ixhila* Levi 1956 (Mexico)

*Mysmena saltuensis* Simon 1885 (Ceylon)

*Mysmena illectrix* Simon 1895 (Philippines Is )

*Mysmena rotunda* (Marples) 1955 (Samoa)

*Mysmena acuminata* (Marples) 1955 (Samoa)

*Mysmena samoensis* (Marples) 1955 (Samoa)

*Mysmena phyllicola* (Marples) 1955 (Samoa)

*Mysmena vitiensis* n sp (Fiji)

*Mysmena conica* n sp (New Guinea)

## TEXTRICELLA Hickman 1945

Type Species *Textricella parva* Hickman 1945 (Tasmania)*Textricella fulva* Hickman 1945 (Tasmania)*Textricella luteola* Hickman 1945 (Tasmania, Australia)*Textricella hickmani* n sp (Tasmania)*Textricella complexa* n sp (Australia)*Textricella lamingtonensis* n sp (Australia)*Textricella aucklandica* Forster, 1955 (Auckland Is)*Textricella nigra* n sp (New Zealand)*Textricella insula* n sp (New Zealand)*Textricella signata* n sp (New Zealand)*Textricella vulgaris* n sp (New Zealand)*Textricella antipoda* n sp (New Zealand)*Textricella mcfarlanei* n sp (New Zealand)*Textricella propinqua* n sp (New Zealand)*Textricella salmoni* n sp (New Zealand)*Textricella plebeia* n sp (New Zealand)*Textricella scuta* n sp (New Zealand)*Textricella pusilla* n sp (New Zealand)*Textricella tropica* n sp (New Guinea)

## MICROPHOLCOMMA Crosby and Bishop, 1927

Type Species *Micropholcomma caeligenus* Crosby and Bishop 1927 (Australia)*Micropholcomma longissima* (Butler 1932) (Australia)*Micropholcomma parmata* Hickman 1944 (Tasmania)*Micropholcomma mira* Hickman 1944 (Tasmania)*Micropholcomma bryophila* (Butler) 1932 (Australia)

## PUA n gen

Type Species *Pua novaezealandiae* n sp (New Zealand)

## PARAPUA n gen

Type Species *Parapua punctata* n sp (New Zealand)

## LUCHARACHNE Bryant 1940

Type Species *Lucharachne tibialis* Bryant 1940 (Jamaica)*Lucharachne palpalis* Krauss 1955 (Honduras)

## Genus TEXTRICELLA Hickman, 1945

**Textricella**, Hickman 1945, Trans Conn Acad Arts Sc 36 1936

Type species (original designation) *Textricella parva* Hickman 1945 Minute spiders ranging from 0.7 mm to 1.2 mm in body length Carapace high, usually from one-half to slightly more than the width of the carapace, ascending steeply in front to the eyes, cephalic portion more or less level on top, slightly rounded and usually highest near the level of the third pair of coxae from where it slopes down to the posterior margin There are a pair of long hairs on the posterior portion of the head region and a single row down the median surface Apart from these hairs and a few smaller hairs about the eyes the carapace is glabrous Fovea absent Six or eight eyes placed in two rows AME when present smallest, separated from each other by less than their diameter Lateral eyes contiguous Median ocular quadrangle much shorter in front than behind Clypeus high, from three to five times the diameter of an ALE

Chelicerae vertical, lateral condyles absent A blunt apophysis is sometimes present on the retrolateral surface of the chelicerae of the males Teeth differing between sexes Females with a single tooth on the retromargin and from 4-5 on promargin Males with 2-5 teeth on retromargin and from 2-3 stout and rod-like bristles on the promargin There is a row of five ciliate setae on the retrolateral surface near the fang furrow in both sexes, and two stout setae, one smooth and one ciliate, placed on a small prominence on the distal prolateral surface near the base of the fang Labium wider than long and fused to the

sternum Maxillae directed across the labium, with an apical scopula and a definite serrula along the anterior margin. Sternum granulate, convex, slightly longer than wide, sub-oval but emarginate at the bases of the coxae, broadly obtuse posteriorly between coxae 4 which are separated by from one to one and a-half times their diameter

Legs short, relative lengths 4 1 2 3 or 1 4 1 2, covered with fine smooth hairs but lacking spines, scopulae or claw tufts Males of some species with a stout bristle on the distal pro-lateral surface of the tibia of the first pair of legs Tarsi much longer than metatarsi A tarsal drum present on the tarsi of both legs and palp in both sexes, situated at approximately one-fifth of the length of the segment from the base in legs 1 and 2 and one-tenth on legs 3 and 4 Trichobothria present on all tibiae, 2 1 on legs 1-3, 1 1.1 1 on leg 4, metatarsus 1-3 with single trichobothrium on median surface Three claws, superior homogeneous, with from 4-6 small teeth reduced in number on legs 3 and 4, inferior claw with a single ventral tooth Female palp small, without claw Male palp with patella processes, tibia usually flattened Bulb relatively simple, conductor sometimes absent Abdomen oval, clothed with small smooth setae usually rising from small sclerotic plates Epigastric plates present in both sexes surrounding the petiolus and usually extending back to the epigastric groove A dorsal plate is often present in the male. Six spinnerets, terminal, compact Colulus large, with two prominent setae

Colour fairly uniform, cephalothorax and appendages reddish or orange-brown, abdomen pale yellow, grey, creamy-white or black

The respiratory system has been described for the three Tasmanian species *parva*, *fulva*, and *luteola* by Hickman (1945) as lacking a posterior tracheal spiracle, book-lungs wanting, with two tracheal spiracles, one on each side in the epigastric groove from which tracheal tubes extend into the abdomen but do not pass into the cephalothorax The respiratory system of a large proportion of the New Zealand species where the slide and KOH preparations have been studied indicates that these species have in general a similar respiratory system

The New Zealand species occupy a similar habitat to that recorded by Hickman for the Tasmanian species They are found in moss on the forest floor and on the trunks of trees in situations which remain moist the year round. The spiders construct small sheet webs which are similar in appearance to those of the Micryphantidae There does not seem to be any indication of a strong seasonal variation in the maturity of the spiders as far as the New Zealand species are concerned as they may be found mature in numbers at any time of the year

Species differentiation is based mainly on the structure of the palp of the males and the internal genitalia of the female The males of a number of species show secondary modifications in the presence of a spine on the first leg and a tubercle or swelling on the chelicerae

Until now the recorded distribution of this family has been Tasmania and the Auckland Islands The material examined during the preparation of the present paper extends this distribution to include New Zealand, the East Coast of Australia, and New Guinea

Further records for the three species described by Hickman (1945) from Tasmania are listed below, and the female internal genitalia which were not figured by Hickman are illustrated for comparison with other species.

**Textricella parva** Hickman 1945 Fig. 1

PREVIOUS RECORD Tasmania: Cascades

PRESENT RECORD. Tasmania Russell Falls, Mount Field, ex moss, February 12, 1955 T. E. Woodward

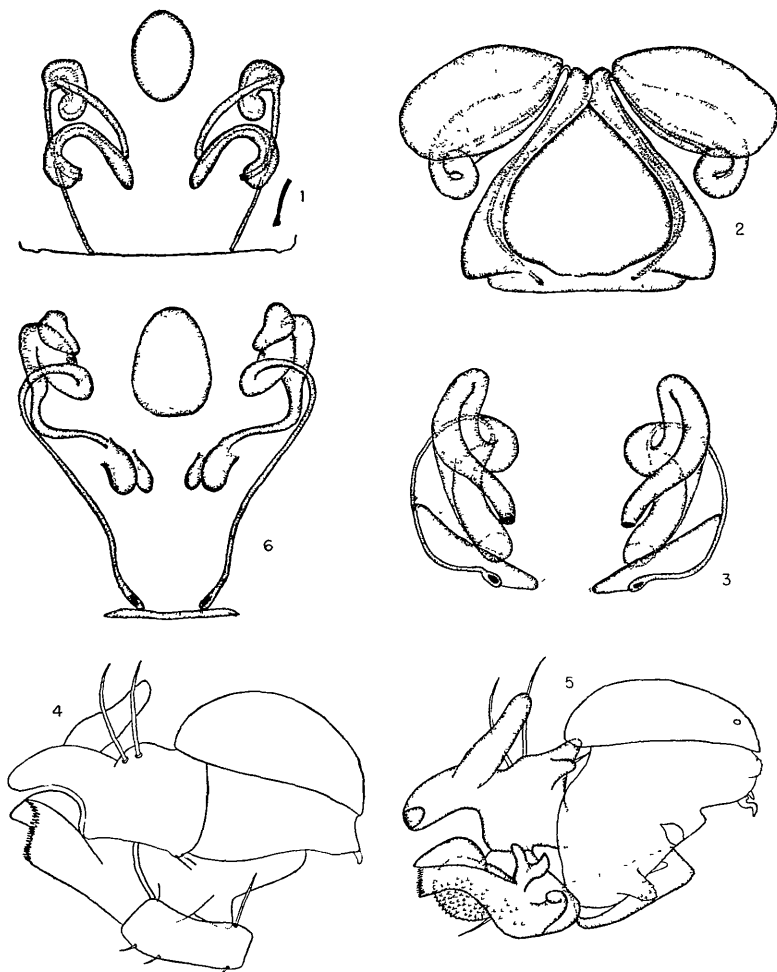
**Textricella fulva** Hickman 1945 Fig. 2

PREVIOUS RECORD Tasmania. Mount Wellington

PRESENT RECORD Tasmania: Lake Dobson Road, 2,500ft Mount Field, National Park, January 7, 1955, T. E. Woodward

**Textricella luteola** Hickman 1945 Fig. 3

PREVIOUS RECORD Tasmania: Mount Wellington



TEXT-FIG 1—Fig 1—*Textricella parca*, female internal genitalia Fig 2—*Textricella fulva*, female internal genitalia Fig 3—*Textricella luteola* female internal genitalia Figs 4–6—*Textricella complexa* n. sp. Fig 4—Prolateral view of male palp Fig 5—Retrolateral view of male palp Fig 6—Female internal genitalia



PRESENT RECORDS New South Wales: National Park, August 24, 1952, T. E. Woodward; Katoombah, Blue Mountains, February 26, 1953, T. E. Woodward; Queensland: Lamington National Park, ex leafmould, rain forest, June 1, 1955, T. E. Woodward; Mount Clunie, east ridge, ex leafmould, April 15, 1953, T. E. Woodward; Mount Tambourine, east side below Eagle Point, May 8, 1953, T. E. Woodward; Mount Tambourine, ex leafmould, July 18, 1954, T. E. Woodward; Blackbut, ex leafmould, September 10, 1953, T. E. Woodward; Mt Tambourine, north side, near Curtis Falls, May 8, 1953, T. E. Woodward; Binna Burra, ex leafmould, July 20, 1952, September 2, 1954, T. E. Woodward; Camp Mount district, Sanford Valley, October 25, 1952, T. E. Woodward, between Landsborough and Caloundra turnoff, ex leaf debris, in Casuarina and Eucalyptus, October 4, 1953, E. N. Marks

***Textricella complexa* n sp Figs 4-9**

MALE Measurements Carapace—Length, 0.56 width, 0.50 height, 0.44 Abdomen—Length, 0.71, width, 0.54

	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
Leg 1	0.37	0.10	0.33	0.12	0.26	1.18
Leg 2	0.35	0.09	0.26	0.11	0.22	1.03
Leg 3	0.34	0.09	0.22	0.11	0.22	0.98
Leg 4	0.38	0.09	0.33	0.14	0.24	1.18

Colour Carapace, sternum and abdominal scutes orange-brown Legs, pale yellow

Eyes (Fig 9) Eight Ratio of AME ALE PME PLE = 5 10 9 10 When viewed from in front the anterior row is almost straight, while the posterior row is recurved AME separated from each other by a distance equal to, and from the ALE by one and a-half times the diameter of an AME PME separated from each other and the PLE by a distance equal to one and a-half times the diameter of an AME Median ocular quadrangle wider behind than in front in the ratio of 27 15, wider behind than long in ratio of 27 24 Clypeus vertical, height equal to five times the diameter of an AME

Chelicerae (Fig 7) There is a strong protuberance present on the mid prolateral surface Promargin with three pegs, retromargin with five teeth, of which the median three are fused at the base

Palp (Figs 4-5) General form very similar to *parva*

Legs 1-4 2 3 Distal prolateral surface of the tibia of leg 1 with strong spines

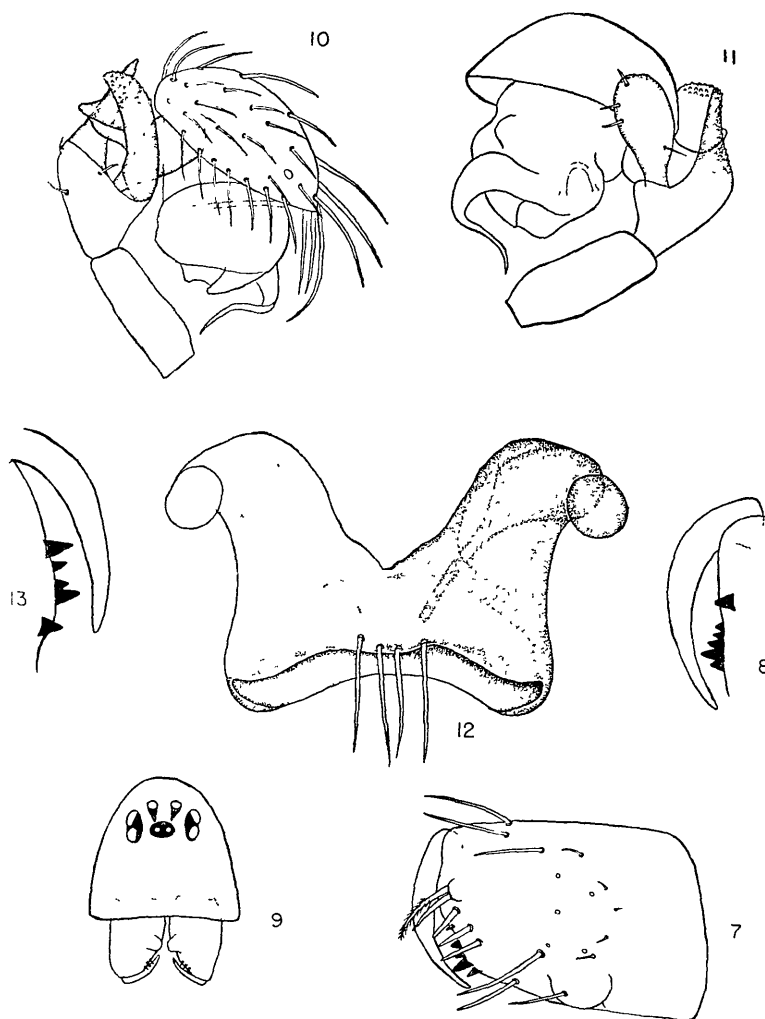
Abdomen Both dorsal and ventral scutes present Ventral scute large, extending over three-fifths of the ventral surface Six spinnerets with colulus, encircled by sclerotic ring

FEMALE Measurements Carapace—Length, 0.50, width, 0.21, height, 0.31 Abdomen—Length, 0.79, width, 0.63

	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
Leg 1	0.33	0.10	0.26	0.11	0.24	1.04
Leg 2	0.27	0.09	0.21	0.10	0.22	0.89
Leg 3	0.25	0.08	0.20	0.10	0.22	0.85
Leg 4	0.37	0.09	0.31	0.12	0.23	1.12
Palp	0.10	0.05	0.08		0.10	0.33

Abdomen bluish-grey with numerous small pale yellow patches Chelicerae with a single tooth on promargin and five on the mid-retromargin of which the distal four decrease in size distally and are fused at the base (Fig 8) Epigynum with two pairs of lobes at about the mid-surface of the ventral plate, under which the external openings of the genitalia are situated Receptaculum seminis at the side of the petiolus with the fertilisation duct running straight back to the posterior margin of the ventral scute (Fig 6)

TYPES Holotype male, allotype female, paratypes New South Wales: National Park, ex leafmould August 24, 1952, T. E. Woodward Holotype and allotype in Queensland Museum, paratypes Otago Museum



TEXT-FIG 2—Figs 7-9—*Textricella complexa* n sp Fig 7—Prolateral view of male chelicera Fig 8—Prolateral view of teeth and fang of female chelicera Fig 9—Carapace and chelicerae from in front of male Figs 10-13—*Textricella nigra* n sp Fig 10—Retrolateral view of male palp Fig 11—Prolateral view of male palp Fig 12—Female epigynum and internal genitalia Fig 13—Retrolateral view of teeth and fang of male chelicera

REMARKS *Textricella complexa* is closely related to *T. parva* Hickman from Tasmania, but it may be easily separated by the structure of the male palp, the female epigynum and the internal genitalia. There is a bilobed structure on the midventral surface of the ventral scute of the female of *complexa* in place of the single curved ridge in *parva*, while the receptaculum extends forward so that it is situated at the side of the petiolus.

***Textricella nigra* n sp. Figs. 10-13.**

MALE Measurements. Carapace—Length, 0.56, width, 0.39, height, 0.42. Abdomen—Length, 0.65, width, 0.46.

	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
Leg 1	0.33	0.10	0.22	0.10	0.23	0.98
Leg 2	0.29	0.09	0.20	0.10	0.23	0.91
Leg 3	0.25	0.09	0.16	0.09	0.20	0.79
Leg 4	0.33	0.10	0.25	0.11	0.23	1.02

Colour Carapace and sternum dark brown, heavily shaded with black. Abdomen dark bluish-grey. Appendages pale brown.

Eyes Eight. Ratio of AME:ALE:PME:PLE = 2.4:3.4. AME separated from each other by a distance equal to 7/10, and from the ALE by a distance equal to, the diameter of an AME. Lateral eyes contiguous. PME separated from each other and from the PLE by a distance equal to one and a-half times the diameter of an AME. Median ocular quadrangle wider behind than in front in proportion of 45:27, wider behind than long in ratio of 45:33. Clypeus vertical, height equal to seven times the diameter of an AME.

Chelicerae (Fig. 13). Without lobes. Promargin with three pegs, retromargin with three teeth.

Palp (Figs. 10-11). Patella with a strongly denticulate, spinous projection on the disto-dorsal surface and a curved plate which originates from the disto-ventral surface. Tibia spatulate, without processes. Bulb simple, embolus stout, gently curved, conductor absent.

Legs 4, 1, 2, 3. There is a slender spine on the distal prolateral surface of the femur of leg 1.

Abdomen. Dorsal scute absent. Mammillary ring present.

FEMALE Measurements: Carapace—Length, 0.48, width, 0.39, height, 0.42. Abdomen—Length, 0.65, width, 0.56.

	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
Leg 1	0.34	0.10	0.23	0.10	0.22	0.99
Leg 2	0.29	0.09	0.21	0.09	0.21	0.90
Leg 3	0.26	0.08	0.16	0.08	0.19	0.77
Leg 4	0.34	0.10	0.25	0.12	0.22	1.03
Palp	0.08	0.04	0.05		0.08	0.25

Chelicerae with a single tooth on the proximal promargin and four on the mid retromargin of which the distal and the proximal are the largest. Epigynum in the form of a raised plate covering a broad chamber. The internal genitalia are shown in Fig. 12.

TYPES Holotype male, allotype female and paratypes. Little Barrier Island, Summit Track, 2,000-2,300 feet ex moss, C. Parkin. (Holotype, allotype, Canterbury Museum, paratypes Otago Museum, Dominion Museum.)

RECORD. Te Aroho Mountain, 3,000-3,100 feet, ex moss on tree trunks, May 6, 1946, J. T. Salmon; Tararua Range, Tiroiro, B. A. Holloway.

REMARKS The complex structure of the patella of the male palp and the wide vestibule to the female epigynum places this species apart from all other known New Zealand species. The specimens from Tiroiro, in the Tararua Ranges, which

are all males, show slight differences from the Te Aroho and Little Barrier material in that the disto-dorsal process on the patella of the palp is shorter and the embolus is relatively longer and more slender

***Textricella hickmani* n sp** Figs 14-19

MALE Measurements Carapace—Length, 0.56, width, 0.44, height, 0.44 Abdomen—Length, 0.58, width, 0.48

	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
Leg 1	0.39	0.13	0.33	0.16	0.27	1.28
Leg 2	0.33	0.11	0.26	0.12	0.25	1.07
Leg 3	0.31	0.10	0.19	0.13	0.24	0.97
Leg 4	0.35	0.12	0.30	0.15	0.27	1.19
Palp	0.17	0.09	0.06		0.21	0.53

**Colour** Carapace dark reddish brown with a black patch on the posterior surface of the head. Sternum dark brown with black shading. Appendages uniform yellow brown. Abdomen steel blue with numerous small white patches.

**Eyes** (Fig 15) Eight. When viewed from in front both rows appear procurved, posterior row more strongly. Ratio of AME:ALE:PME:PLE = 5:10:6:15. The AME are separated from each other by their diameter and from the ALE by twice this distance. Laterals contiguous. PME separated from each other by twice and from the PLE by three times the diameter of an AME. Ocular quadrangle wider behind than in front in the ratio of 22:15. Clypeus vertical, height equal to six times the diameter of an AME.

**Chelicerae** Pronounced tubercle present. Promargin with three pegs, two proximal, one distal, retromargin with from 2-3 small teeth.

**Legs 1-4-2-3** Femur of leg 1 with a long slender spine on the distal prolateral surface as shown in Fig 19.

**Palp** (Fig 14) The tarsus and the bulb appear to be carried twisted back so that the bristles on the distal surface of the tarsus are projecting over the denticulate surface of the distal portion of the patella. The embolus is stout and lightly coiled with the tip resting behind the process from the patella, where it is held in place by two stout setae.

**Abdomen** Dorsal scute absent. Plates at the base of hairs weakly developed. Spinnerets with sclerotic ring.

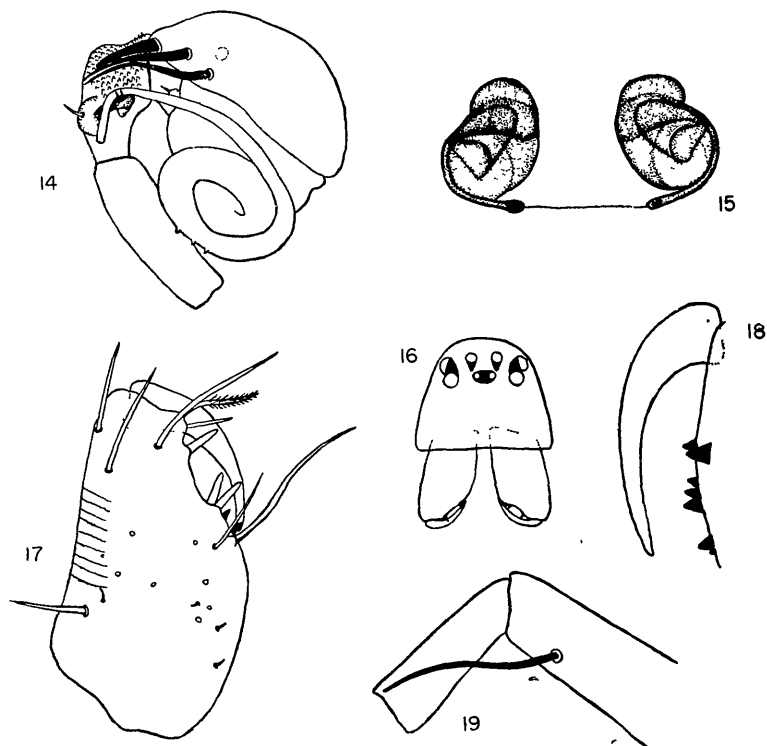
FEMALE Measurements Carapace—Length, 0.67, width, 0.48, height, 0.33. Abdomen—Length, 0.84, width, 0.60.

	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
Leg 1	0.39	0.10	0.33	0.15	0.30	1.27
Leg 2	0.35	0.12	0.26	0.14	0.26	1.13
Leg 3	0.34	0.09	0.24	0.13	0.24	1.04
Leg 4	0.44	0.10	0.34	0.15	0.30	1.33
Palp	0.12	0.06	0.09		0.09	0.36

Similar in general structure to male. Chelicerae with a single tooth on the mid promargin and six (1-3-2) on the retromargin (Fig 18). The internal genitalia are compact (Fig 15). The external openings lead into a cup-shaped receptaculum, which is followed by a convoluted portion before narrowing to the fertilisation duct, which is twisted around the outer margin to reach the posterior margin of the epigastric groove at the inner level of the receptacula.

**TYPES** Holotype male, allotype female, paratypes. Tasmania. Mount Wellington, ex moss from near O'Grady's Falls, January 29, 1955, T. E. Woodward (Holotype, allotype, Queensland Museum, paratypes Otago Museum, collection Dr V. V. Hickman).

**REMARKS** This species is closely related to *Textricella luteola* Hickman with which it is sympatric in Tasmania. It is clearly separated from *luteola* by the structure of the male palp and the internal genitalia of the female. I have much pleasure



TEXT-FIG 3—Figs 14–19—*Textricella hickmani* n sp Fig 14—Retrolateral view of male palp Fig 15—Internal genitalia of female Fig 16—Carapace and chelicerae of male from in front Fig 17—Prolateral view of male chelicera Fig 18—Prolateral view of female chelicera Fig 19—Distal surface of femur and patella, leg 1 of male showing spine

in naming this species after Dr V V Hickman, who first established the genus to which it belongs, in some recognition of the great advances he has made in the study of the spider fauna of Tasmania and Australia

*Textricella lamingtonensis* n sp Figs 20–22

MALE Measurements Carapace—Length, 9.65, width, 0.48, height, 0.44 Abdomen—Length, 0.67, width, 0.51

	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
Leg 1	0.44	0.10	0.37	0.14	0.28	1.39
Leg 2	0.42	0.14	0.31	0.12	0.25	1.24
Leg 3	0.35	0.12	0.25	0.12	0.25	1.09
Leg 4	0.44	0.10	0.33	0.14	0.29	1.30
Palp	0.14	0.06	0.06		0.12	0.38

**Colour.** Carapace dark brown with black shading on posterior surface of the head. Sternum brown with black shading. Abdomen bluish-grey with small pale spots.

**Eyes.** Eight, both rows slightly recurved when viewed from in front. Ratio AME:ALE:PME:PLE = 6:10.9:10. AME separated from each other by  $\frac{1}{2}$  of their width and from the ALE by a distance equal to  $1\frac{1}{2}$  times the diameter of an AME and from the PLE by slightly more than this distance. Median ocular quadrangle wider behind than in front in ratio of 9:5 and wider behind than long in ratio of 9:8. Clypeus vertical, height equal to  $4\frac{1}{2}$  times width of an AME.

**Chelicerae** (Fig 22). Stout, vertical, without boss. Promargin with two distal pegs, retromargin with five teeth, of which three are contiguous.

**Palp** (Fig 20). Patella with single typical knobbed process. Tibia flattened. Bulb simple with short stout conductor and embolus surrounded by small denticles.

**Legs.** 1 4 2 3, without secondary spine.

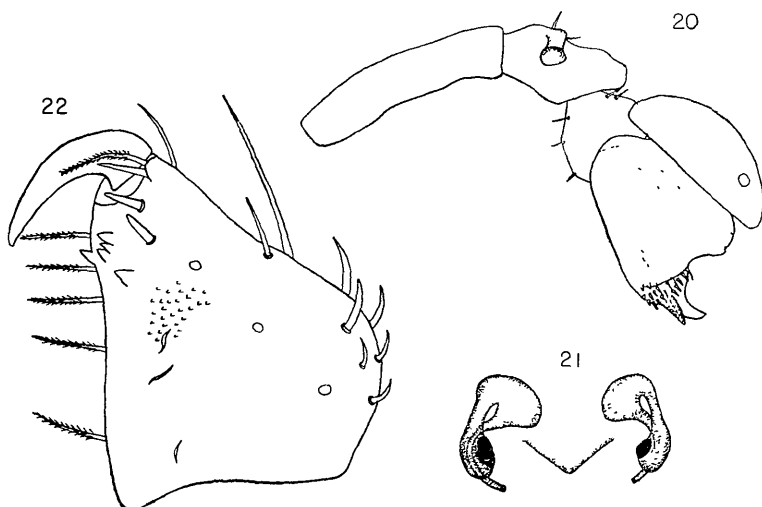
**Abdomen.** Dorsal scute lacking, ventral scute extending back to the epigastric groove. Spinnerets surrounded by a distinct sclerotic ring.

**FEMALE Measurements.** Carapace—Length, 0.63, width, 0.46, height, 0.33. Abdomen—Length, 0.69, width, 0.60.

	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
Leg 1	0.37	0.11	0.26	0.12	0.25	1.11
Leg 2	0.33	0.09	0.25	0.12	0.22	1.01
Leg 3	0.29	0.08	0.18	0.12	0.22	0.89
Leg 4	0.37	0.10	0.35	0.18	0.25	1.25
Palp	0.11	0.06	0.07		0.10	0.34

**Colour** and general structure as in male. Chelicerae with two promarginal and five retromarginal teeth. Internal genitalia simple, as shown in Fig 21.

**TYPES.** Holotype male, allotype female and paratypes, S. Queensland Lamington National Park, ex leafmould, rain forest, June 1, 1955, T. E. Woodward (Holotype, allotype, Queensland Museum, paratypes Otago Museum).



TEXT-FIG 4.—Figs 20–22—*Tetricella lamingtonensis* n. sp. Fig 20—Retrolateral view of palp. Fig 21—Internal genitalia of female. Fig 22—Retrolateral view of male chelicera.

REMARKS Of the five species now described from Tasmania and Australia, this is the only species which shows the simple structure of male and female genitalia characteristic of most of the New Zealand species. The form of the male and female genitalia clearly separates it from all New Zealand species.

*Texttricella insula* n sp. Fig. 23.

MALE Measurements: Carapace—Length, 0.46; width, 0.35; height, 0.33. Abdomen—Length, 0.75; width, 0.60.

	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
Leg 1	0.33	0.10	0.24	0.11	0.22	1.00
Leg 2	0.26	0.09	0.20	0.10	0.22	0.87
Leg 3	0.25	0.08	0.15	0.10	0.20	0.78
Leg 4	0.34	0.10	0.23	0.12	0.22	1.01
Palp	0.09	0.06	0.05		0.09	0.29

*Colour* Carapace and abdominal scutes dark golden brown, appendages yellow brown.  
*Eyes* Eight. Ratio of AME:ALE:PME:PLE = 5:20:11:20. AME separated from each other by a distance slightly less than the diameter of an AME and from the ALE by twice this distance, PME separated from each other by twice and from the PLE by three times the diameter of an AME. Median ocular quadrangle wider behind than in front in ratio of 33:14, while the ratio of width behind to length is 33:24.

Clypeus vertical, height equal to six times the diameter of an AME.

*Chelicerae* Without boss. With two pegs on promargin and five teeth on retromargin.  
*Palp* (Fig. 23). There is a distal lobe on the patella in addition to the usual knobbed process. Bulb simple with slender curved embolus, conductor straight and slender.

*Legs* 4:1:2:3 without secondary spines.

*Abdomen* Both dorsal and ventral scutes well developed. Mammillary ring present.

TYPES Holotype male and paratype male. Solander Island, ex leafmould, July 20, 1948, C. Lindsay. (Holotype male, Dominion Museum, Paratype male, Canterbury Museum.)

REMARKS. Close to *T. signata* from Canterbury and Westland, but separated from this species by the structure of the male palp and differences in the spacing of the eyes.

*Texttricella signata* n sp. Figs. 24–25.

MALE Measurements: Carapace—Length, 0.58; width, 0.42; height, 0.33. Abdomen—Length, 0.63; width, 0.48.

	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
Leg 1	0.37	0.10	0.29	0.15	0.22	1.13
Leg 2	0.33	0.10	0.25	0.11	0.22	1.01
Leg 3	0.29	0.10	0.22	0.12	0.23	0.96
Leg 4	0.38	0.10	0.33	0.15	0.27	1.23
Palp	0.14	0.07	0.07		0.13	0.41

*Colour* Cephalothorax and abdominal scutes deep golden brown, appendages paler yellow brown.

*Eyes* From in front the anterior row appears slightly recurved, while the posterior row is more strongly recurved. Ratio of AME:ALE:PME:PLE = 4:20:15:20. AME separated from each other by twice and from the ALE by  $2\frac{1}{2}$  times, the diameter of an AME. The PME are separated from each other and from the PLE by a diameter of an AME. Median ocular quadrangle wider behind than in front in ratio of 50:20 and wider behind than long in ratio of 50:29. Clypeus equal to six times the diameter of an AME.

*Chelicerae* Without secondary processes. Promargin with three pegs, retromargin with two teeth.

*Palp* (Fig 24) Very similar in appearance to *insula* but with the knobbed process on patella more proximal in position The conductor appears to be absent

*Legs* 4 1 2 3, without secondary spines

*Abdomen* Both dorsal and ventral scutes well developed Spinnerets enclosed by sclerotic ring

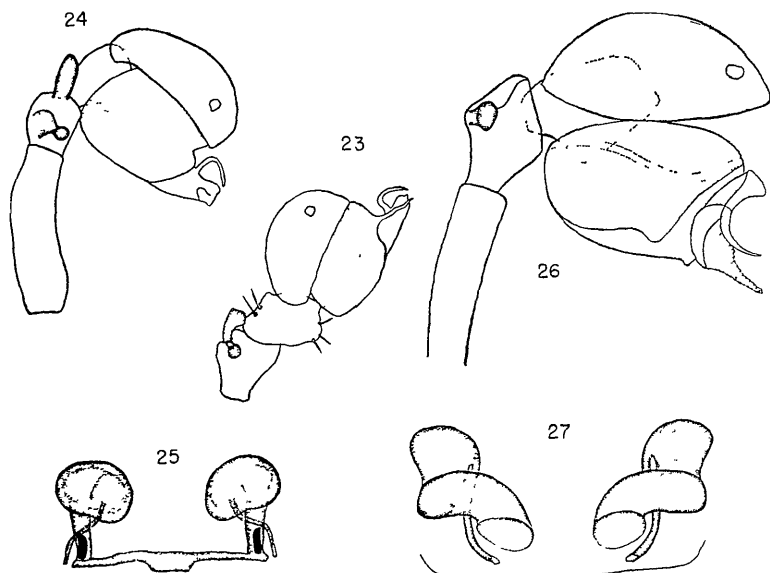
**FEMALE Measurements** Carapace—Length, 0.54, width, 0.44, height, 0.33 Abdomen—Length, 0.77, width, 0.65

	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
Leg 1	0.40	0.12	0.29	0.15	0.25	1.20
Leg 2	0.37	0.11	0.27	0.12	0.26	1.13
Leg 3	0.32	0.10	0.20	0.12	0.26	1.00
Leg 4	0.40	0.12	0.37	0.15	0.31	1.35
Palp	0.14	0.05	0.08		0.09	0.36

The abdomen is grey, without dorsal scute but with definite ring surrounding the spinnerets Internal genitalia as in Fig 25, with a sclerotic strip posteriorly Chelicerae with a single tooth on the promargin and three on the retromargin

**TYPES** Holotype male, allotype female and paratypes Canterbury Lake Janet, August 1, 1949, R R Forster Paratypes, same locality, August 28, 1951, J S Dugdale. (Holotype, allotype Canterbury Museum, paratypes Otago Museum, Dominion Museum)

**RECORDS** Canterbury. Lake Rubicon, ex moss, November 19, 1950, R R Forster, Westland, Waitangituna River, ex leafmould, December 5, 1949, R R Forster



TEXT-FIG 5—Fig 23—*Textricella insula* n sp Retrolateral view of male palp Figs 24–25—*Textricella signata* n sp Fig 24—Retrolateral view of male palp Fig 25—Female internal genitalia Figs 26–27—*Textricella propinqua* n sp Fig 26—Retrolateral view of male palp Fig 27—Female internal genitalia



***Textricella propinqua* n sp** Figs 26-27

MALE Measurements Carapace—Length, 0.52, width, 0.42, height, 0.25 Abdomen—Length, 0.79, width, 0.52

	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
Leg 1	0.41	0.11	0.33	0.12	0.24	1.21
Leg 2	0.37	0.10	0.28	0.11	0.24	1.10
Leg 3	0.33	0.10	0.24	0.11	0.24	1.02
Lot 4	0.41	0.11	0.35	0.14	0.29	1.30

*Colour* Cephalothorax and abdominal scutes golden brown, legs pale yellow brown

*Eyes* Six Ratio ALE PME PLE = 3 2 3 The PME are small and are separated from each other by a distance equal to twice their diameter and by slightly more than this distance from the PLE. The ALE are separated from each other by a distance equal to five times the diameter of a PME

*Chelicerae* With protuberance on prolateral surface Promargin with 3 pegs, 2 basal and 1 distal, retromargin with 3 teeth, one basal, two distal

*Palp* (Fig 26) Dorsal surface of the patella beyond knobbed process excavated Conductor very stout and denticulate

*Abdomen* The abdominal hairs each rise from a small sclerotic plate as in most species of *Textricella*, but they are somewhat larger and more conspicuous in *propinqua* and the lateral surfaces between the scutes tend to be furrowed Both dorsal and ventral scutes are present Spinnerets encircled by sclerotic ring

FEMALE Measurements Carapace—Length, 0.52, width 0.42, height, 0.23 Abdomen—Length, 0.73, width, 0.50

	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
Leg 1	0.37	0.11	0.31	0.16	0.30	1.25
Leg 2	0.36	0.10	0.26	0.18	0.26	1.16
Leg 3	0.31	0.10	0.24	0.14	0.23	1.02
Leg 4	0.41	0.11	0.37	0.16	0.30	1.35
Palp	0.14	0.05	0.07		0.10	0.36

Abdomen pale golden yellow, setal plates distinct Internal genitalia as in Fig 27 Chelicerae with one tooth on promargin, 4 on retromargin.

*TYPES* Holotype male, allotype female, paratypes Cass River ex moss, May 23, 1954, J. S. Dugdale; Paratypes, Cass, ex moss, December 25, 1950, B. Wisely (Holotype, allotype, Canterbury Museum, paratypes Otago Museum, Dominion Museum)

*RECORDS* Canterbury Craigieburn Stream, February 5, 1950, A. G. McFarlane; Okuku Pass, ex moss, May 21, 1956, R. R. Forster, Lewis Pass, Kiwi Valley, ex leafmould, November 14, 1949, R. R. Forster, Broken River, ex leafmould, February 5, 1950, A. G. McFarlane Westland Lake Paringa, ex leafmould, January 26, 1954, J. T. Salmon, boundary Murchison and Buller Counties, December 3, 1949, J. H. Sorensen, Moana, ex leafmould, March 10, 1950, R. R. Forster; same locality, September 3, 1951, B. Wisely, Seddonville, ex leafmould, April 19, 1948, A. W. B. Powell, Bruce Bay, ex leafmould, from boggy White Pine forest, January 27, 1954, J. T. Salmon Nelson Salisbury Hut, Mt Arthur Tableland, ex moss, February 21, 1946, J. T. Salmon Fiordland. Key Summit, ex leafmould, January 26, 1946, R. R. Forster.

*REMARKS* This species appears to be most closely related to *salmonii* from the North Island, with which it agrees in having only six eyes, but the stout conductor of the male palp and the structure of the female internal genitalia clearly separates it from this species

***Textricella vulgaris* n sp** Figs 28-32

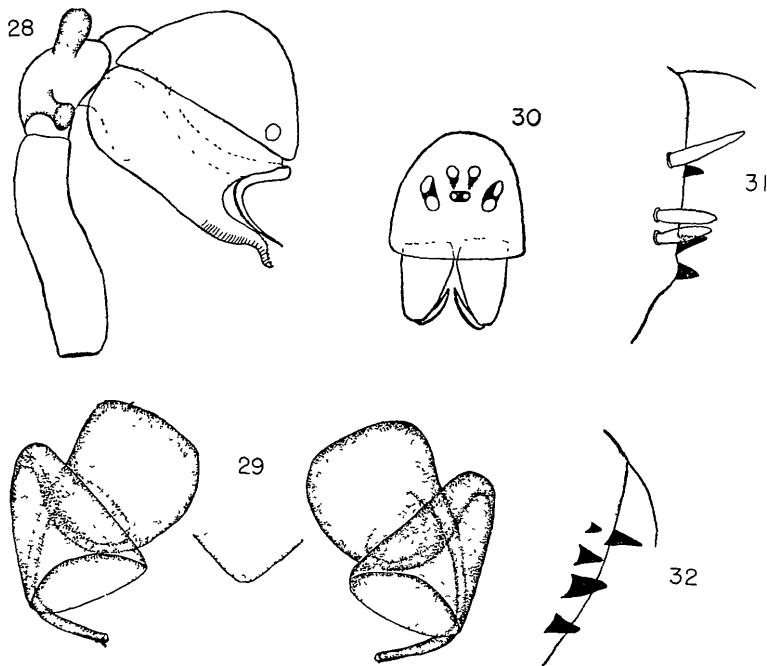
MALE Measurements Carapace—Length, 0.44, width, 0.37, height, 0.26 Abdomen—Length, 0.62, width, 0.39.

	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
Leg 1	0.37	0.10	0.33	0.14	0.26	1.10
Leg 2	0.35	0.10	0.26	0.12	0.23	1.06
Leg 3	0.29	0.09	0.20	0.12	0.22	0.92
Leg 4	0.40	0.10	0.33	0.16	0.26	1.25
Palp	0.17	1.09	0.09		0.16	0.51

*Colour* Carapace and sternum and scutes orange-brown. Appendages paler brown.

*Eyes* (Fig 30) Eight. When viewed from above the posterior row appears straight and the anterior row slightly procurved, from in front both rows appear somewhat recurved. Ratio of AME:ALE:PME:PLE = 3:11:10:12. The AME are separated from each other by a distance equal to their width and from the ALE by  $2\frac{1}{2}$  times this distance. The PME are separated from each other by a distance equal to three times the width of an AME and from the PLE by slightly more than this distance. Clypeus vertical, equal in height to six times the diameter of an AME.

*Chelicerae* (Fig 31) Without boss. With three pegs on promargin and three teeth on retromargin.



TEXT-FIG 6—Figs 28-32—*Textricella vulgaris* n sp. Fig 28—Retrolateral view of male palp. Fig 29—Internal genitalia of female. Fig 30—Carapace and chelicerae from in front. Fig 31—Retrolateral view of male cheliceral teeth. Fig 32—Prolateral view of female cheliceral teeth.

*Legs* 4 1 2 3 Spines lacking  
*Palp* (Fig 28) Patella with a strong, bluntly round lobe on the disto-dorsal surface  
*Conductor* stout  
*Abdomen* Both dorsal and ventral scutes present Spinnerets encircled by sclerotic ring  
*FEMALE* Measurements: Carapace—Length, 0.42, width, 0.35, height, 0.25 Abdomen—  
 Length, 0.68, width, 0.41

	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
Leg 1	0.41	0.10	0.27	0.12	0.26	1.19
Leg 2	0.36	0.10	0.24	0.12	0.25	1.07
Leg 3	0.29	0.09	0.22	0.11	0.20	0.91
Leg 4	0.41	0.09	0.30	0.16	0.29	1.25
Palp	0.10	0.05	0.07		0.15	0.37

Abdomen without dorsal scute ranging in colour from creamy white to dark grey Internal genitalia as in Fig 29 Chelicerae with four teeth on promargin and one on retromargin as shown in Fig 32

*TYPES.* Holotype male, allotype female, paratypes, Fiordland: Lake Te Au near South Arm of Lake Te Anau, ex moss, Jan 12–24, 1953, R. R. Forster (Holotype, allotype, paratypes, Canterbury Museum, paratypes, Otago Museum, Dominion Museum)

*RECORDS* Fiordland: Lake Gunn, ex leafmould, December 29, 1944, J. T. Salmon; Lake Manapouri, ex leafmould, February 6, 1946, R. R. Forster; Beehive, South side of Lake Manapouri, ex leafmould, February 6, 1946, R. R. Forster; Peninsula, south side of Lake Manapouri, ex moss and lichens, February 6, 1946, R. R. Forster; Cleddau Valley, ex leafmould, December 20, 1943, J. T. Salmon; Lake Hankerson, February 14, 1953, J. Ramsay; Cascade Creek, Eglinton Valley, ex moss, February 10, 1955, R. R. Forster, same locality, January 23, 1951, R. R. Forster, April 10, 1956, H. Walker; Caswell Sound, ex moss, April 2, 1949, R. R. Forster; Stillwater Base Camp, Caswell Sound, ex leafmould, April 11, 1949, R. R. Forster; Martins Bay, ex leafmould, January 28, 1955, R. R. Forster Westland Moana, ex leafmould, September, 1951, B. Wisely; Taipo River, ex leafmould, January 3, 1951, R. Jacobs; Lake Ianthe, ex leafmould, January 27, 1954, J. T. Salmon; Franz Josef, ex moss, August 2, 1953, M. Warren; same locality, April 26, 1951, R. R. Forster; Fergusons Bush, near Hokitika, ex leafmould, December 9, 1949, R. R. Forster; Okarito, ex moss, December 7, 1949, R. R. Forster; Bruce Bay, ex leafmould, January 10, 1956, W. Clark Nelson Flora Saddle, 3,200ft, ex moss, January 20, 1948, R. R. Forster, Flora Track, 3,000ft, ex leafmould, January 29, 1948, R. R. Forster, Leslie Valley Track, ex leafmould, January 23, 1948, R. R. Forster; Lake Hanlan, Karamaea Bluff, ex leafmould, January 29, 1954, J. T. Salmon; Salisbury Opening, Mt Arthur Tableland, ex moss, January 23, 1948, J. T. Salmon Canterbury: Lewis Pass, Kiwi Valley, ex moss, November 14, 1949, R. R. Forster; Arthur's Pass, 2,500ft, ex leafmould, January 14, 1951, E. W. Dawson, same locality, ex moss, December 9, 1949, R. R. Forster, McGrath's Creek, Arthur's Pass, ex leafmould, January 3, 1950, E. W. Dawson; Anticrow River, ex moss, October 15, 1952, J. S. Dugdale; Upper Doubtful River, ex leafmould, April 6, 1953, W. F. Dukes, Lake Sumner, ex moss, April 13, 1952, J. S. Dugdale; Lake Rubicon, ex moss, November 19, 1950, R. R. Forster; Lake Janet, August 28, 1951, J. S. Dugdale; Mount Cook, Governor's Bush, ex leafmould, December 1, 1948, J. T. Salmon.

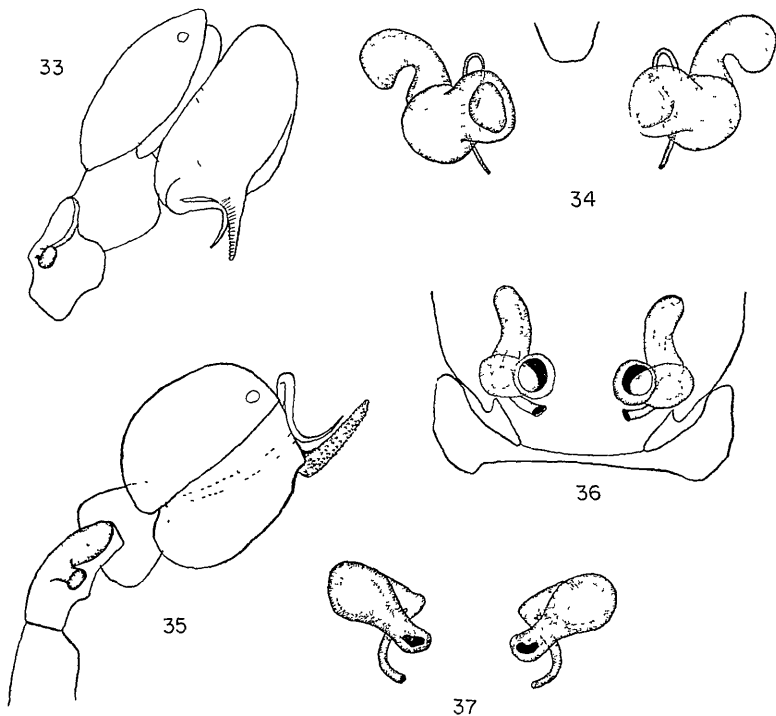
*REMARKS* This distinctive species appears to be limited mainly to the West side of the Southern Alps, but has extended its range to the east through Arthurs Pass to Canterbury.

**Textrixella antipoda** n.sp Figs 33-34

MALE Measurements Carapace—Length, 0.46, width, 0.39, height, 0.29 Abdomen—Length, 0.56, width, 0.44

	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
Leg 1	0.29	0.12	0.29	0.11	0.21	1.02
Leg 2	0.27	0.10	0.23	0.10	0.23	0.93
Leg 3	0.23	0.10	0.19	0.09	0.19	0.80
Leg 4	0.31	0.10	0.31	0.12	0.25	1.09
Palp	0.21	0.10	0.08		0.19	0.58

**Colour** Cephalothorax and abdominal scutes deep golden brown. Appendages pale brown.  
**Eyes** Eight. Ratio of AME: ALE: PME: PLE = 5: 15: 11: 15. AME separated from each other and from the ALE by a distance equal to the diameter of an AME. PME separated from each other and the ALE by twice this distance. Median ocular quadrangle twice as wide behind as in front, while the ratio of the width behind to the length is 6: 5. Clypeus vertical, height equal to eight times the diameter of an AME.



TEXT-FIG 7—Figs 33-34 *Textrixella antipoda* n.sp. Fig 33—Retrolateral view of male palp. Fig 34—Internal genitalia of female. Figs 35-36—*Textrixella mcFarlanei* n.sp. Fig 35—Retrolateral view of male palp. Fig 36—Internal genitalia of female. Fig 37—*Textrixella plebeia* n.sp. Internal genitalia of female.

*Chelicerae* with a small secondary tubercle on the proximal surface

*Palp* (Fig 33) Patella with a platelike process beyond the usual knobbed process Conductor stout and ridged transversely

*Legs* 4 1 2 3 with no spines

*Abdomen* With well developed dorsal and ventral scutes Spinnerets encircled by a sclerotic ring

FEMALE Measurements Carapace—Length, 0.46, width, 0.39, height — Abdomen—Length, 0.69, width, 0.54

	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
Leg 1	0.33	0.10	0.24	0.10	0.24	1.01
Leg 2	0.29	0.10	0.19	0.09	0.20	0.87
Leg 3	0.26	0.09	0.17	0.09	0.20	0.81
Leg 4	0.33	0.10	0.29	0.11	0.22	1.05
Palp	0.07	0.05	0.05		0.09	0.26

Abdomen pale grey, setae based in small sclerites Dorsal scute absent, spinnerets enclosed in sclerotic ring Internal genitalia as in Fig 34

TYPES Holotype male, allotype female, paratypes Meads Landing, Lake Hawea (Canterbury Museum)

REMARKS The structure of the male palp and internal genitalia of the female indicates a close relationship between this species and *mcFarlanei*

*Textricella mcfarlanei* n sp Figs 35–36

MALE Measurements Carapace—Length, 0.46, width, 0.42, height, 0.27 Abdomen—Length, 0.63, width, 0.44

	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
Leg 1	0.29	0.08	0.26	0.10	0.23	0.96
Leg 2	0.26	0.09	0.24	0.10	0.21	0.90
Leg 3	0.25	0.09	0.18	0.09	0.20	0.81
Leg 4	0.29	0.10	0.27	0.11	0.24	1.01
Palp	0.15	0.07	0.10		0.18	0.50

*Colour* Cephalothorax and abdominal scutes deep golden brown, legs pale yellow-brown

*Eyes* Eight Ratio of AME ALE PME PLE = 7 20 10 20 AME separated from each other by distance equal to half diameter of AME and from ALE by distance equal to the diameter of an AME PME are separated from each other and from the PLE by a distance equal to  $1\frac{1}{2}$  times the width of an AME Median ocular quadrangle wider behind than in front in ratio of 30 18 and wider behind than long in ratio of 30 23 Clypeus vertical, height equal to 7 times diameter of an AME

*Chelicerae* without tubercle Promargin with three pegs, retromargin with 2 teeth

*Palp* As shown in Fig 35

*Abdomen* Dorsal and ventral scutes present Ventral scute extending back to epigastric furrow Spinnerets encircled by sclerotic ring

FEMALE Measurements Carapace—Length, 0.46, width, 0.35, height, 0.25 Abdomen—Length, 0.67, width, 0.52

	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
Leg 1	0.29	0.10	0.24	0.11	0.19	0.93
Leg 2	0.27	0.09	0.20	0.10	0.18	0.84
Leg 3	0.22	0.10	0.18	0.10	0.18	0.78
Leg 4	0.33	0.10	0.27	0.12	0.22	1.04
Palp	0.09	0.06			0.07	0.28

Abdomen grey Dorsal scute absent Chelicerae with three teeth on retromargin, one on promargin Internal genitalia as in Fig 36

**TYPES** Holotype male, allotype female, paratypes Southland Temple River, Lake Ohau, ex leafmould January, 1950, A G McFarlane (Holotype, allotype, Canterbury Museum, paratype, Otago Museum)

**Textricella plebeia** n sp Fig 37

**FEMALE** Measurements Carapace—Length, 0.56, width, 0.39, height, 0.35 Abdomen—Length, 0.58, width, 0.50

	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
Leg 1	0.31	0.12	0.28	0.13	0.28	1.12
Leg 2	0.29	0.10	0.22	0.10	0.22	0.93
Leg 3	0.29	0.10	0.22	0.10	0.22	0.93
Leg 4	0.33	0.11	0.28	0.13	0.26	1.11
Palp	0.12	0.05	0.05		0.09	0.31

**Colour** Cephalothorax yellow brown, appendages dull yellow

**Abdomen** creamy white

**Eyes** Six Ratio ALE:PME:PLE = 5:3:5 The PME are separated from each other by a distance equal to their width and from the PLE by  $2\frac{1}{2}$  times this width ALE separated from each other by distance equal to  $2\frac{1}{2}$  times their width Clypeus vertical, height equal to the distance between the ALE

**Chelicerae** without protuberance Promargin with four teeth, retromargin with single tooth

**Abdomen** Setal sclerites small Internal genitalia as shown in Fig 37 Spinnerets encircled by a faint sclerotic ring

**TYPES** Holotype female and paratype female Codfish Island, Sealers Bay, November 4, 1948, R K Dell (Holotype Dominion Museum, paratype Otago Museum)

**REMARKS** This species is related to both *propinqua* and *salmoni*, but the female internal genitalia are clearly distinct from either of these two species

**Textricella salmoni** n sp Figs 38-45

**MALE** Measurements Carapace—Length 0.50 width, 0.39, height 0.33 Abdomen—Length, 0.60, width, 0.48

	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
Leg 1	0.35	0.10	0.26	0.12	0.22	1.05
Leg 2	0.31	0.09	0.22	0.11	0.22	0.95
Leg 3	0.27	0.09	0.18	0.10	0.20	0.84
Leg 4	0.37	0.11	0.29	0.14	0.22	1.13
Palp	0.15	0.09	0.09		0.14	0.47

**Colour** Cephalothorax and abdominal scutes reddish-brown Appendages pale yellow-brown

**Eyes** Six Ratio of ALE:PME:PLE 2:1:2 The ALE are separated from each other by a distance equal to twice the diameter of an ALE PME separated from the PLE by a distance equal to the width of an ALE and from each other by half this distance Height of clypeus equal to twice the diameter of an ALE

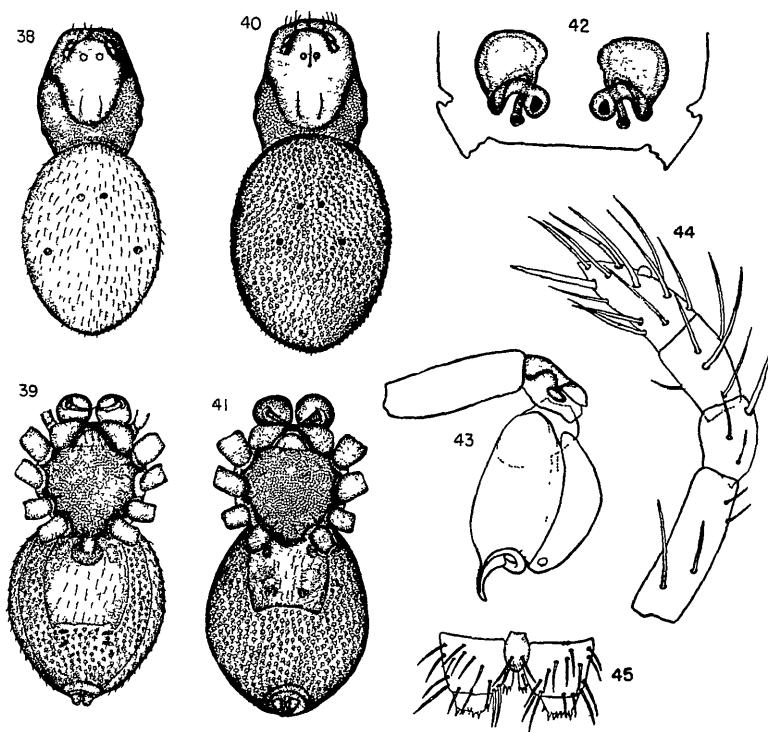
**Chelicera** without lobes, promargin with three pegs, retromargin with four teeth

**Palp** As in Fig 43 Patella without distal process, excavated below knobbed process

**Legs** 4:1:2:3, without spines

**Abdomen** Dorsal and ventral scutes present Six spinnerets with colulus enclosed by sclerotic ring (Fig 45)

**FEMALE** Measurements Carapace—Length, 0.41, width, 0.39, height, 0.29 Abdomen—Length, 0.73, width, 0.63



TEXT-FIG 8—Figs 38–45—*Textricella salmoni* n.sp. Fig 38—Dorsal surface of body of male Fig 39—Ventral surface of body of male Fig 40—Dorsal surface of body of female Fig 41—Ventral surface of body of female Fig 42—Internal genitalia of female Fig 43—Retrolateral view of male palp Fig 44—Female pedipalp Fig 45—Colulus and spinnerets of female

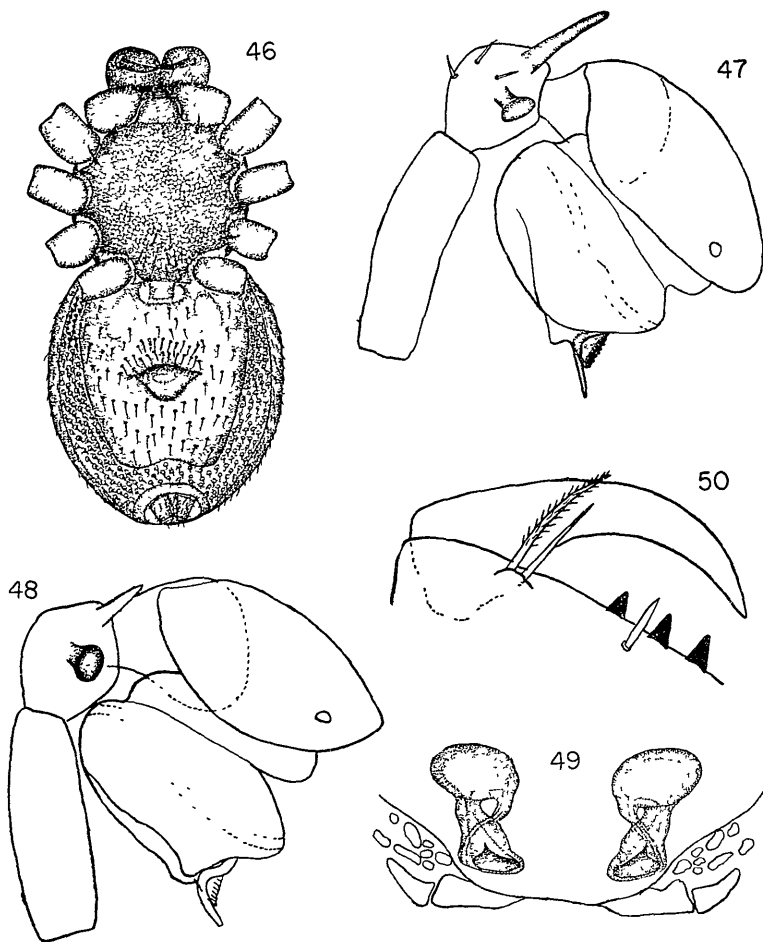
	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
Leg 1	0.31	0.09	0.22	0.10	0.20	0.92
Leg 2	0.21	0.08	0.16	0.08	0.15	0.68
Leg 3	0.20	0.07	0.15	0.08	0.14	0.64
Leg 4	0.32	0.10	0.23	0.11	0.21	0.97
Palp	0.11	0.05	0.05		0.09	0.30

Abdomen pale yellow. Chelicerae with one tooth on promargin, 4 on retromargin. Internal genitalia as in Fig 42.

**TYPES** Holotype male, allotype female, paratypes. Desert Road, ex leafmould, April 28, 1956, J. T. Salmon; paratype same locality, March 24, 1948, R. R. Forster (Holotype, allotype Dominion Museum, paratypes Otago Museum, Canterbury Museum).

**RECORDS** Waiouru, Morere Stream, November, 1953, R. K. Dell; Waikaremoana, Maruana Arm, ex leafmould, December 11, 1946, R. R. Forster, Ngamoko Track, 2,300ft, ex leafmould and moss, May 9, 1956, R. R. Forster, Mt. Gnamoko,

3,000ft, ex leafmould, December 13, 1946, R R Forster; Mamaku Bush, near Rotorua, March 23, 1946, J T Salmon, Rotoehu near Rotorua, January 10, 1952, R J. Thornton; Te Marua, ex leafmould, April 12, 1947, G Ramsay; Horopito, ex leafmould, December 22, 1948, R R Forster Wellington Tararua Range, below Field's Hut, ex moss and lichen, February 1, 1952, B A Holloway; Akatarawa Divide, 1,500ft, ex leafmould, January 3, 1947, J T Salmon Wairarapa. Mount Ross, ex leafmould, April 5, 1947, R R Forster, Turanganui River, ex leafmould, June 14, 1947, R K. Dell



TEXT-FIG 9—Figs 46-50—*Tetricella scuta* n sp. Fig 46—Ventral view of body of male Fig 47—Retrolateral view of male palp (Cascade Creek) Fig 48—Retrolateral view of male palp (type locality) Fig 49—Internal genitalia of female Fig 50—Retrolateral view teeth of male chelicera



REMARKS This species is named for Dr J T Salmon who first developed in New Zealand the systematic use of the Berlese Funnel techniques by which large series of microspiders have been secured.

**Texttricella scuta** n sp Figs 46–50

MALE Measurements: Carapace—Length, 0.56, width, 0.44, height, 0.39 Abdomen—Length, 0.61, width, 0.50

	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
Leg 1	0.37	0.12	0.29	0.10	0.23	1.11
Leg 2	0.35	0.10	0.18	0.10	0.22	0.95
Leg 3	0.26	0.10	0.19	0.09	0.22	0.86
Leg 4	0.37	0.12	0.33	0.12	0.24	1.16
Palp	0.14	0.09	0.10		0.19	0.52

*Colour* Cephalothorax and abdominal scutes deep yellow-brown. Legs pale yellow-brown.  
*Eyes* Six. Ratio of ALE:PME:PLE = 4:3:4. ALE separated by distance equal to twice their diameter. PME separated from each other by distance equal to half diameter of an ALE and from the PLE by distance equal to the diameter of a PME. Clypeus vertical, height equal to  $2\frac{1}{2}$  times the diameter of an AME.

*Chelicerae* without secondary tubercle. Promargin with 1 peg, retromargin with 3 teeth.

*Legs* Typical, without a secondary spine.

*Palp* (Figs. 47, 48). Patella with a sharp, slender disto-dorsal projection in addition to the knobbed process. This projection is relatively longer and more slender in the specimens from Fiordland. The conductor is short and stout, with the dorsal surface serrate.

*Abdomen* The most striking character distinguishing this species is the extension of the ventral scute back to approximately  $\frac{2}{3}$  of the distance between the epigastric groove and the spinnerets (Fig. 46). The spinnerets are encircled by a sclerotic ring.

FEMALE Measurements: Carapace—Length, 0.56, width, 0.37, height, 0.33. Abdomen—Length, 0.75, width, 0.61.

	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
Leg 1	0.37	0.15	0.29	0.15	0.23	1.19
Leg 2	0.35	0.12	0.22	0.12	0.22	1.03
Leg 3	0.28	0.10	0.20	0.12	0.22	0.92
Leg 4	0.41	0.15	0.33	0.15	0.26	1.30
Palp	0.10	0.05	0.07		0.11	0.33

Abdomen creamy white, shaded with grey, internal genitalia as in Fig. 49. Mamillary ring not well defined. Chelicera with four teeth on promargin, one on retromargin (Fig. 50).

TYPES Holotype male, allotype female, paratypes, Hawkes Bay, Norsewood, ex leafmould, January 27, 1948, P J Culleford (Holotype, allotype, Dominion Museum, paratypes, Canterbury Museum, Otago Museum).

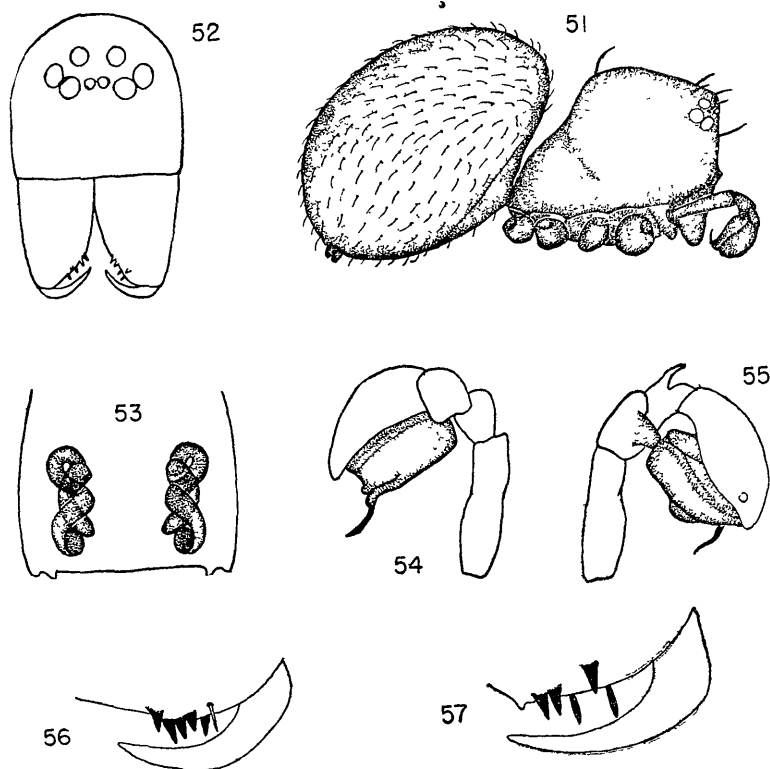
RECORDS North Island—Taranaki Dawson Falls, Mt Egmont, ex leafmould, sub-alpine belt, 3,600ft, May, 1954, M P Beecher. Wellington: Stokes Valley, ex moss, August 10, 1952, B A Holloway, Wainui-o-mata Waterworks, Skull Gully Ridge, ex leafmould, B A Holloway. South Island—Canterbury: Cass, ex moss, December 23, 1950, R R Forster, Carrington Hut, Junction of White and Waimakariri rivers, ex moss, October 11, 1952, J S Dugdale. Nelson: Lake Hanlon, Karamea Bluff, ex leafmould, January 29, 1954, J T Salmon. Westland: Camerons, ex leafmould, September 5, 1950, R A Chapman. Fiordland: Cascade Creek, Eglinton Valley, ex moss, February 10, 1955, R R Forster; West Te Anau, 3,000ft, ex leafmould, February 1, 1950, R S Duff, Milford Sound, ex leafmould, January 20, 1946, R R Forster, Manapouri, ex leaf litter, September 17, 1957, B J Marples.

REMARKS *Texttricella scuta* is the only known species where the ventral scute of the male extends back beyond the epigastric groove. Both the internal genitalia of the female and the male palp readily distinguish the species from all other known forms.

*Texttricella pusilla* n sp Figs 51-57

MALE Measurements Carapace—Length, 0.39, width, 0.31, height, 0.27 Abdomen—Length, 0.46, width, 0.40

	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
Leg 1	0.22	0.08	0.18	0.08	0.18	0.72
Leg 2	0.20	0.08	0.12	0.08	0.14	0.62
Leg 3	0.18	0.05	0.10	0.07	0.13	0.53
Leg 4	0.21	0.08	0.16	0.08	0.15	0.68
Palp	0.10	0.04	0.05		0.11	0.30



TEXT-FIG 10—Figs 51-57—*Texttricella pusilla* n sp Fig 51—Side view of male Fig 52—Carapace and chelicerae from in front Fig 53—Internal genitalia of female Fig 54—Proximal surface of male palp Fig 55—Retrolateral surface of male palp Fig 56—Teeth of female chelicera Fig 57—Teeth of male chelicera

*Colour* Cephalothorax and legs dark reddish-brown. Abdomen black.

*Carapace* (Fig 51). Smooth and shiny Almost as high as wide When viewed from the side almost square in outline, dorsal surface of the head region flat, thoracic region short, steeply sloping.

*Eyes* (Fig 52) Eight From above both rows appear straight but from in front the anterior row is strongly procurved and the posterior row gently procurved. Ratio of AME:ALE:PME:PLE = 3:8.5:8 The AME are separated from each other and from the ALE by the diameter of an AME The PME are separated from each other and from the PLE by a distance equal to twice the diameter of an AME The median ocular quadrangle is wider behind than in front in the ratio of 8:5 and the ratio of width behind to length is 8:6 Clypeus vertical, height equal to five times the diameter of an AME.

*Chelicerae* (Fig 57). Retromargin with three sharp teeth, two basal teeth contiguous, promargin with two pegs

*Legs* 1 4 2 3 Legs 1-3 with two (1.1) trichobothria on tibiae and one on metatarsi Leg 4 with three (1.1) trichobothria or tibia, none on metatarsus. Tarsal drum proximal

*Palp* (Fig 54) Patella with a broad retrolateral lobe Tibia with a strong dorsal spinous process Bulb simple with a short, sharp embolus, conductor absent

*Abdomen* Oval, small ventral scute, dorsal scute lacking

*FEMALE Measurements* Carapace—Length, 0.38, width, 0.31, height, 0.27. Abdomen—Length, 0.51, width, 0.44

	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
Leg 1	0.20	0.07	0.15	0.07	0.16	0.65
Leg 2	0.18	0.07	0.10	0.06	0.12	0.53
Leg 3	0.17	0.06	0.10	0.05	0.12	0.50
Leg 4	0.20	0.08	0.15	0.07	0.14	0.64
Palp	0.06	0.02	0.03	0.06		0.17

Similar in general structure to male Chelicerae with a single tooth on promargin and 4 teeth on retromargin (Fig 56) Internal genitalia as in Fig. 53

*TYPES* Holotype male, allotype female, paratypes Canterbury: Creek east of Dog Hill, tributary of Hurunui River, ex moss, May 12, 1952, J. S. Dugdale. (Holotype, allotype, Canterbury Museum, paratypes, Otago Museum, Dominion Museum.)

*RECORDS* Canterbury: Mount Grey, ex moss, March 27, 1951, R. R. Forster. Okuku Pass, ex moss, April 6, 1952, J. S. Dugdale; same locality, March 30, 1952, J. S. Dugdale Wellington. Orongorongo, ex moss on slopes of the Catchpole Stream, October 25, 1954, V. J. Wilson, Little Barrier Island, Summit Track, 2,000-2,300 feet, ex moss, C. Parkin.

*REMARKS* The structures of the genitalia of both male and female are most distinctive and separate the species sharply from all other known species, but the general structural characters seem to indicate that the species is correctly located in *Textrixella*

*Textrixella tropica* n.sp. Figs 58-63

*MALE Measurements* Carapace—Length, 0.39, width, 0.41, height, 0.25 Abdomen—Length, 0.42, width, 0.29

	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
Leg 1	0.28	0.11	0.26	0.09	0.19	0.93
Leg 2	0.22	0.10	0.17	0.09	0.20	0.78
Leg 3	0.24	0.09	0.14	0.08	0.18	0.73
Leg 4	0.28	0.08	0.26	0.10	0.21	0.93

*Colour* Cephalothorax and appendages reddish brown Abdomen bluish black, with a number of small yellow patches

*Carapace*. Finely coriaceous not as high as wide.

**Eyes** (Fig 58) Eight, relatively large From above posterior row appears straight, anterior recurved, from in front both rows appear gently procurved Ratio of AME ALE PME PLE = 2 5 5·5 The AME are separate from each other by  $\frac{1}{2}$  and from the ALE by  $\frac{3}{4}$  of the diameter of an AME PLE separated from each other and from the PLE by a distance equal to the diameter of an AME Median ocular quadrangle wider behind than in front in the ratio of 12 5 and wider behind than long in the ratio of 12 10 Clypeus vertical, equal in height to three times the diameter of an AME

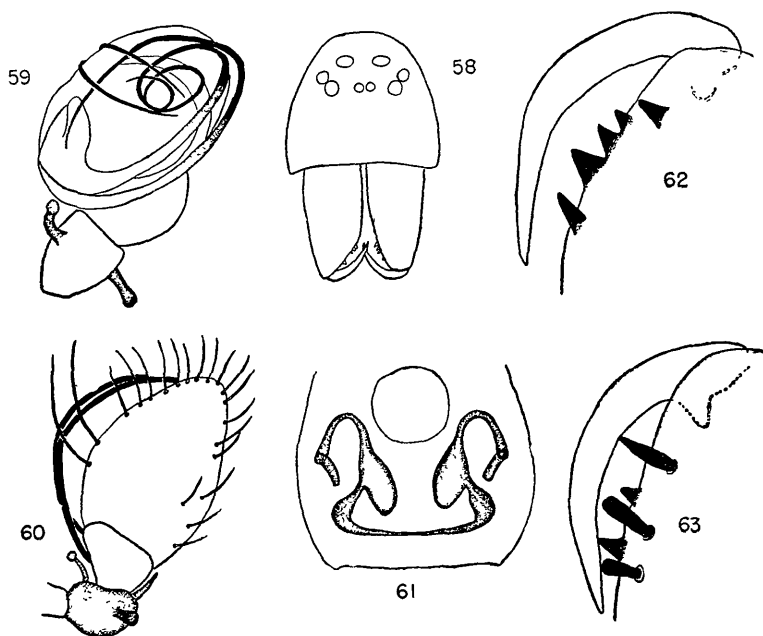
**Chelicerae** (Fig 63) Retromargin with two teeth, promargin with three "pegs"

**Legs** 1·4 2·3 Spines absent Two (1 1) trichobothria are present on the tibia of legs 1-3, three (1 1 1) on the tibia of leg 4 Metatarsi of legs 1-3 with single trichobothrium

**Palp** (Figs 59, 60) Patella with three processes Conductor and embolus filiform

**Abdomen** Ventral plate small, dorsal plate lacking Six spinnerets with prominent colulus, mammillary ring lacking

**FEMALE Measurements** Carapace—Length, 0 37, width, 0 36, height, 0 23 Abdomen—Length, 0 40, width, 0 34



TEXT-FIG 11—Figs 58-63—*Tetricella tropica* n. sp. Fig 58—Carapace and chelicerae from in front Fig 59—Male palp from below Fig 60—Male palp from above Fig 61—Internal genitalia of female Fig 62—Female chelicera Fig 63—Male chelicera

	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
Leg 1	0 25	0 09	0 21	0 09	0 19	0 83
Leg 2	0 21	0 08	0 17	0 09	0 21	0 76
Leg 3	0 18	0 08	0 13	0 08	0 19	0 66
Leg 4	0 31	0 09	0 21	0 08	0 18	0 87
Palp	0 08	0 04	0 05		0 08	0 25

In general appearance as in male Internal genitalia as shown in Fig 61 Cheliceral teeth as in Fig 62

**TYPES.** Holotypes male, allotype female, New Guinea, Daulo Pass, Central Highlands, ex moss, rain forest, 8,000ft, August 22, 1956, T. E. Woodward; paratypes, Comanigu Valley, Ramu-Purari Divide, ca. 3 miles, S W. of Mount Otto, Central Highlands, 7,500–8,500 feet, ex moss, rain forest, August 18, 1956, T. E. Woodward. (Holotype, allotype, Queensland Museum, paratypes Otago Museum.)

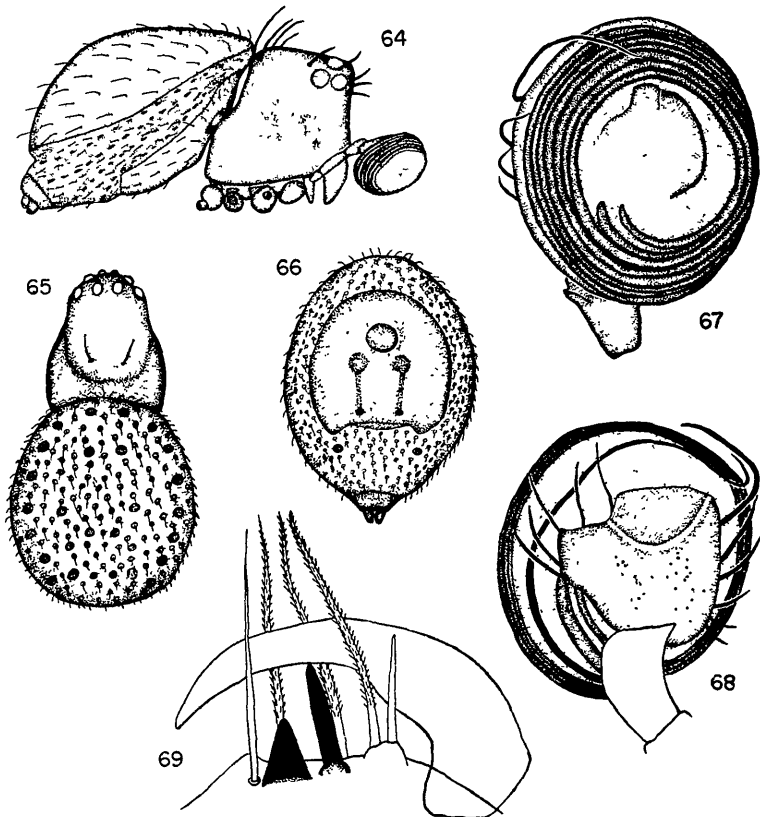
**Genus MICROPHOLCOMMA Crosby and Bishop, 1927**

1927 *Micropholcomma* Crosby and Bishop, Journ N Y Entomol Soc 35.

1932 *Microlynopheus* Butler, Proc Roy Soc Victoria 44 (2)

1932 *Plectochetos* Butler, Proc Roy Soc Victoria 44 (2)

Crosby and Bishop established *Micropholcomma* for a species from Victoria. In 1932 Butler established the genera *Microlynopheus* and *Plectochetos* for two further species from Victoria Hickman considered that *Microlynopheus bryophila*



TEXT-FIG 12—Figs 64–69—*Micropholcomma longissima* (Butler). Fig 64—Side view of body of male Fig 65—Dorsal view of body of female Fig 66—Ventral view of abdomen of female Fig 67—Retrolateral view of male palp Fig 68—Prolateral view of male palp Fig 69—Male chelicera

Butler should be placed in *Micropholcomma* and a close examination of both males and females of *Plectochetos longissimus* Butler and the structure of the respiratory system leads me to conclude that this species is also congeneric with *M. caeligenus* Crosby and Bishop.

***Micropholcomma longissima* (Butler) 1932**

1932 *Plectochetos longissimus* Butler Proc Roy Soc Victoria 44 (2), p 107  
Figs 64-69

MALE Measurements Carapace—Length, 0.38, width, 0.36, height, 0.32 Abdomen—Length, 0.60, width, 0.56

	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
Leg 1	0.31	0.11	0.23	0.11	0.21	0.97
Leg 2	0.28	0.10	0.22	0.10	0.20	0.90
Leg 3	0.26	0.10	0.21	0.10	0.19	0.86
Leg 4	0.31	0.11	0.26	0.11	0.23	1.02
Palp	0.09	0.07	0.06		0.16	0.38

**Colour** Cephalothorax, appendages and soft portions of abdomen pale yellow-brown. Abdominal scutes darker brown.

**Carapace** (Fig 64) Seen from the side the carapace is almost square. The dorsal surface of the head region is flattened and slopes very very steeply down to the posterior margin of the carapace. There is no thoracic groove.

**Eyes** Eight. From above the posterior row is strongly recurved. Ratio of AME:ALE:PME:PLE = 4:6:6:5. AME separated from each other and ALE by distance equal to half of diameter of an AME. Lateral contiguous, PME separated from each other and from the PLE by a distance equal to the diameter of an AME. Clypeus high, slightly concave, height equal to five times the diameter of an AME.

**Chelicerae** (Fig 69) Vertical, without boss. There appears to be a single tooth and a stout peg on the retromargin, promargin smooth. There is a long smooth hair at the side of the tooth and 2 ciliate hairs on the promargin with a distal mound from which extend a long ciliate hair and a shorter smooth hair.

**Legs** 4:1:2:3. Clothed with slender, smooth hairs, except on ventral surfaces of metatarsi and tarsi of legs 3 and 4, where the hairs are stronger and serrated. Three trichobothria present only on tibiae arranged 2:1 on legs 1-3 but 1:1:1 on leg 4. No trichobothria on metatarsi. Three claws, superior homogeneous with 3-4 teeth, inferior smooth. Tarsal drum proximal.

**Palp** (Figs 67, 68) Tibia with a short projection on the mid-dorsal surface. Tarsus and bulb twisted out so that the morphologically ventral surface is retrolateral. Tarsus flattened with irregular shape as shown in Fig 68, distal surface indented. Conductor coiled.

**Abdomen** Ovoid, not rising above carapace. Well developed scutes present on both dorsal and ventral surfaces. Lateral surfaces with longitudinal ridges. Six spinnerets and colulus in compact group, posteriorly situated, encircled by sclerotic ring.

**FEMALE** Abdomen without dorsal scute but surface coriaceous with numerous small sclerotic plates of which the smaller are setose. The openings of the epigynum are placed in front of the posterior margin of the ventral scute. Internal genitalia simple. A long, straight tube leads back to a simple receptaculum which is situated immediately behind the petiolus (Fig 66).

**TYPE** Male described by Butler from Mt Donna Buang, Victoria, in National Museum of Victoria.

**RECORDS** Tasmania Dove River, near Crater Lake, Cradle Mountain, ex moss in Beech forest, February 21, 1955, T. W. Woodward. N.S. Wales National Park, ex leafmould, August 24, 1952, T. E. Woodward. S. Queensland. Beechmont, August 1, 1954, T. E. Woodward.

**REMARKS** This species was originally placed by Butler into a separate genus *Plectochetos*. I consider that the species is congeneric with *Micropholcomma bryophila* (Butler) described in the same paper.

**Micropholcomma bryophila** (Butler) 1932

NEW RECORDS Tasmania: Hugel River, Tasmania, Lake St. Clair National Park, ca 2,700ft, ex moss, beech forest, February 15, 1955, T. E. Woodward. Victoria: Mount Donna Buang, ex leafmould, rain forest, January 18, 1951, T. E. Woodward. N.S. Wales: Barrington Tops, ex moss, December 22, 1957, T. E. Woodward. S. Queensland: Beechmont, ex leafmould, August 1, 1954, T. E. Woodward.

**Genus PUA n. gen.**

Carapace high, without thoracic groove. Six eyes in two groups of three. Sternum convex, obtuse behind. Chelicerae without condyle, teeth present on both margins. Maxillae convergent. Legs 4 1 2 3, without spines. Trichobothria present on tibiae of all legs, absent from metatarsi. Tarsi much longer than metatarsi, tarsal drum proximal. Three claws. Male palp with patellar process. Female palp small without claw, with reduced number of segments. Abdomen in both sexes with dorsal and ventral scute. Six spinnerets and colulus. Posterior spiracles lacking. Anterior spiracles supplying tracheae to both cephalothorax and abdomen.

Type species *Pua novaezealandiae* n. sp.

This genus appears to be closely related to *Micropholcomma*, from which it is clearly separated by the number and arrangement of the eyes, differences in the distribution of trichobothria and the absence of the posterior spiracle.

**Pua novaezealandiae** n. sp. (Figs 70–77)

MALE Measurements. Carapace—Length, 0.37, width, 0.31, height, 0.29. Abdomen—Length, 0.48, width, 0.48.

	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
Leg 1	0.21	0.10	0.21	0.10	0.21	0.83
Leg 2	0.20	0.08	0.15	0.09	0.21	0.73
Leg 3	0.19	0.08	0.15	0.06	0.20	0.68
Leg 4	0.26	0.09	0.24	0.10	0.26	0.95
Palp	0.10	0.05	0.04		0.13	0.32

**Colour.** Body and appendages golden yellow.

**Carapace** (Fig. 70). Smooth. From the side the head region appears gently rounded, highest posteriorly where it slopes steeply to the posterior margin. There are four median pairs of setae along the dorsal surface of the head progressively smaller anteriorly. Thoracic groove absent.

**Eyes** (Fig. 72). Six in two triads. Ratio of ALE : PME : PLE = 4 : 3 : 4. From above the posterior row is recurved, while from in front it appears procurved. The lateral eyes are subcontiguous. PLE separated from AME by distance equal to  $\frac{1}{2}$  width of an ALE. ALE and PME both separated from each other by a distance equal to the diameter of an AME.

**Chelicerae** (Fig. 73). Vertical without boss. Furrow with short basal tooth and a small tooth and longer peg on promargin. Four ciliate hairs above promargin.

**Maxillae** somewhat triangular, transverse. Labium fused, twice as wide as long. Sternum convex smooth, almost as wide as long, terminated broadly behind, separating coxae 4 by twice their width.

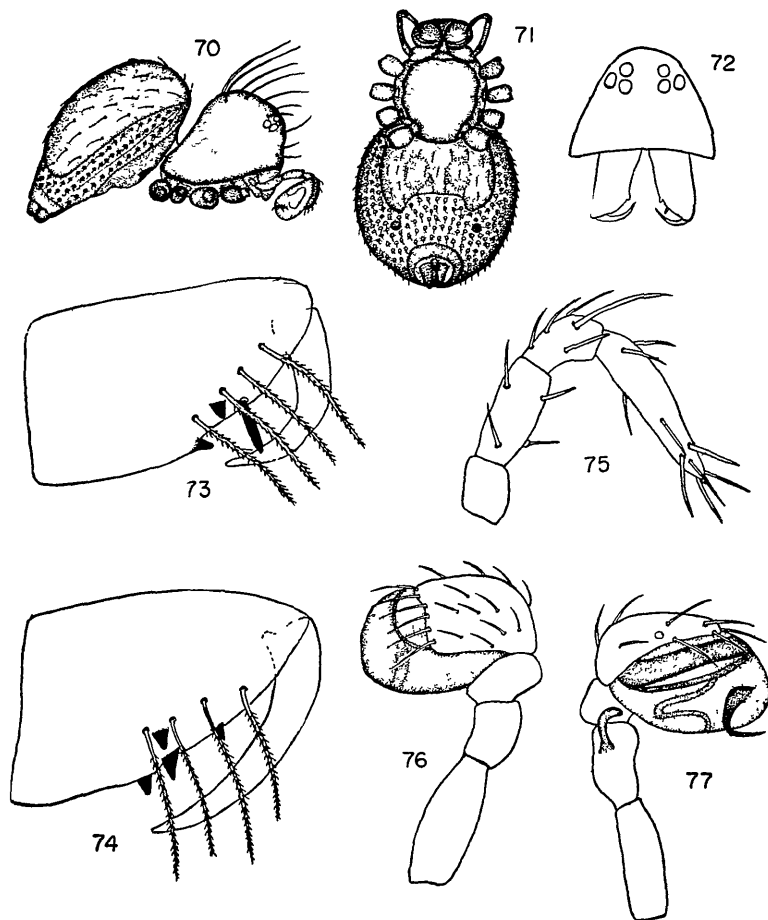
**Legs** 4 1 2 3. Clothed with smooth hairs, spines lacking. Tarsal drum proximal. Three claws, apparently smooth. Tibiae of legs 1–3 with two trichobothria, one at  $\frac{1}{4}$ , the other at  $\frac{1}{2}$  of the length of the segment. Tibia 4 with row of three. Trichobothria absent from all metatarsi.

**Palp** (Figs 76, 77). There is a blunt, curved process on the distal retrolateral surface of the patella. Bulb simple with a short curved embolus on the sub-distal retrolateral surface.

**Abdomen** (Fig. 70). Oval, with well developed scutes on both dorsal and ventral surfaces. Six spinnerets and colulus surrounded by sclerotic ring.

FEMALE Measurements. Carapace—Length, 0.34, width, 0.29, height, 0.22. Abdomen—Length, 0.56, width, 0.48.

	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
Leg 1	0 26	0 08	0 21	0 11	0 21	0 87
Leg 2	0 23	0 07	0 18	0 10	0 21	0 79
Leg 3	0 21	0 05	0 18	0 08	0 21	0 73
Leg 4	0 31	0 08	0 21	0 11	0 22	0 93
Palp Three segments			0 05	0 02	0 08	0 15



TEXT-FIG 13—Figs 70–77—*Pua novaezealandiae* n gen, n sp Fig 70—Side view of male Fig 71—Ventral view of female Fig 72—Carapace and chelicerae of male showing eyes Fig 73—Chelicera of male Fig 74—Chelicera of female Fig 75—Female pedipalp Fig 76—Prolateral surface of male palp Fig 77—Retrolateral view of male palp



Similar in general character to the male. Both dorsal and ventral scutes are present. Internal genitalia simple, in form of single large sacs, which are visible as patches through the ventral scute (Fig 71). The pedipalps are small, with the tibia and tarsus fused into a single segment (Fig 75). There is a minute, blunt, distal process present which has the appearance of a vestigial claw.

**TYPES** Holotype male, allotype female and paratypes—Canterbury: Lewis Pass, 2,200ft, ex leafmould, January 29, 1956, R. R. Forster (holotype, allotype, Canterbury Museum, paratypes, Otago Museum, Dominion Museum).

**RECORDS.** North Island: Lake Waikaremoana, ex leafmould, December 19, 1946, R. R. Forster; Waikaremoana, Panikiri Bluff, 3,800ft, December 12, 1946, R. R. Forster; Horopito, ex leafmould, December 22, 1948, R. R. Forster; Wellington, Pinehaven, February 22, 1953, R. K. Dell; Day's Bay, November 30, 1947, R. R. Forster; Tararua Range, below Field Hut, ex moss and lichens, December 8, 1952, B. A. Holloway. South Island: Canterbury, Kiwi Valley, Lewis Pass, ex leafmould, November 14, 1949, R. R. Forster; Lake Rubicon, ex moss, November 19, 1950, R. R. Forster. Westland: Camerons, September 5, 1950, R. A. Chapman.

#### Genus *PARAPUA* n.gen.

Carapace high, without thoracic groove. Eight eyes in two rows. Posterior row recurved. Sternum convex, broadly rounded behind. Chelicerae without condyles, teeth on retromargin only. Legs 1-4-2-3 without spines, trichobothria on all tibiae and metatarsi of legs 1-3, absent from metatarsus 4. Tarsi much longer than metatarsi, tarsal drum proximal, three claws. Male palp with patellar process. Female palp without claw, small, with reduced number of segments. Abdomen with ventral scute, dorsal scute lacking. Six spinnerets and colulus. Posterior spiracle absent, tracheae from anterior spiracles supplying both cephalothorax and abdomen.

Type species *Parapua punctata* n.sp.

*Parapua* shares many characters with *Micropholcomma*, but may be separated from it by the absence of a posterior spiracle and the different form of the male palp.

#### *Parapua punctata* n.sp. (Figs 78-81)

**MALE.** Measurements: Carapace—Length, 0.51, width, 0.50, height, 0.31. Abdomen—Length, 0.67, width, 0.67.

	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
Leg 1	0.58	0.15	0.48	0.25	0.32	1.78
Leg 2	0.50	0.15	0.41	0.21	0.30	1.57
Leg 3	0.42	0.12	0.37	0.21	0.30	1.42
Leg 4	0.49	0.13	0.43	0.22	0.31	1.58
Palp	0.06	0.06			0.19	0.31

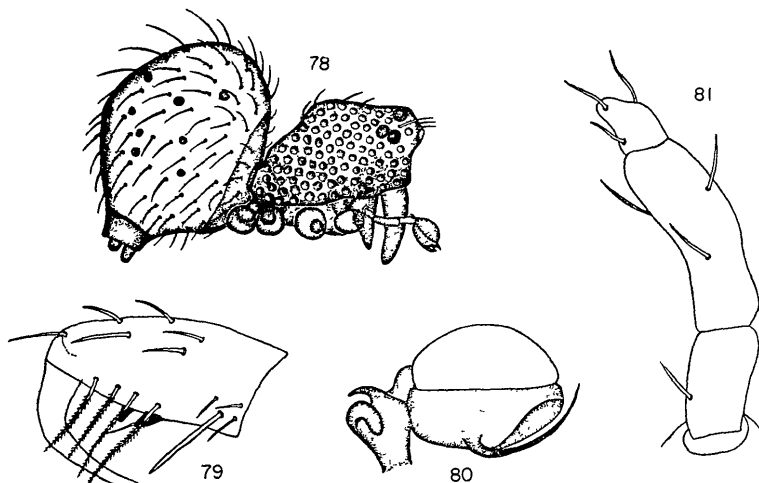
**Colour.** Cephalothorax and abdominal scutes deep reddish-brown. Appendages paler yellow-brown. Soft portions of abdomen blackish grey.

**Carapace** (Fig 78). Coarsely punctate. The anterior portion of the eye region slightly overhangs the clypeus. The head region is flat when viewed from the side and the slopes, and then slopes gently down posteriorly to the petiolus. Thoracic groove lacking.

**Eyes.** Eight. When viewed from above both rows are strongly recurved, when viewed from in front the posterior row appears procurved while the anterior row is recurved. Ratio of AME:ALE:PME:PLE = 6:6.7:6. AME are separated from each other by  $\frac{1}{3}$  and from the ALE by  $\frac{1}{2}$  of width of an AME. Lateral eyes contiguous. PME separated from each other by  $\frac{1}{2}$  and separated from the PLE by a distance equal to the diameter of an AME. Clypeus curving under the AME, height equal to three times the diameter of an AME. Clypeus curving under the AME, height equal to three times the diameter of an AME.

**Chelicerae** (Fig 79). Vertical, without lobes. There is a single tooth on mid-retromargin and further proximal tooth, but the promargin is smooth.

**Sternum.** Convex, coarsely granulate, slightly longer than wide, almost round in outline, joined to carapace by strips between the coxae. Coxae 4 separated by a distance equal to one



TEXT-FIG 14—Figs 78–81—*Parapua punctata* n gen, n sp Fig 78—Side view of body of male Fig 79—Male chelicera Fig 80—Retrolateral surface of male palp Fig 81—Female palp.

and a-half times their diameter. Maxillae, twice as long as wide, oblique. Labium fused to sternum, twice as wide as long.

**Palp** (Fig 80). Patella with a blunt lobe on the subdistal dorsal surface curved over to the retrolateral surface, followed by a sharp erect process. Bulb simple with a slender spinous embolus on the retrolateral surface. Conductor absent.

**Legs**. Spines absent. Clothed with smooth hairs. Tibiae of legs 1–3 with three (1 1 1) trichobothria, metatarsi with a single median trichobothrium. Tibia of leg 4 with four (1 2 1) trichobothria, metatarsus none. Tarsal drum proximal. Three claws, prolateral with a ventral row of from 15–20 strong teeth, retrolateral and inferior smooth.

**Abdomen**. Subglobose, sparsely clothed with long and short smooth hairs, spinnerets ventral. Dorsal scute absent, with a number of round sclerotic patches on both dorsal and lateral surfaces. Ventral scute encircling the petiolus. Six spinnerets and colulus enclosed by a broad sclerotic ring.

**FEMALE**. Measurements. Carapace—Length, 0.55, width, 0.54, height, 0.40. Abdomen—Length, 0.71, width, 0.64.

	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
Leg 1	0.54	0.13	0.42	0.28	0.34	1.71
Leg 2	0.48	0.12	0.42	0.23	0.32	1.57
Leg 3	0.40	0.10	0.38	0.18	0.31	1.37
Leg 4	0.50	0.12	0.38	0.21	0.32	1.53
Palp	0.03		0.06		0.02	0.11

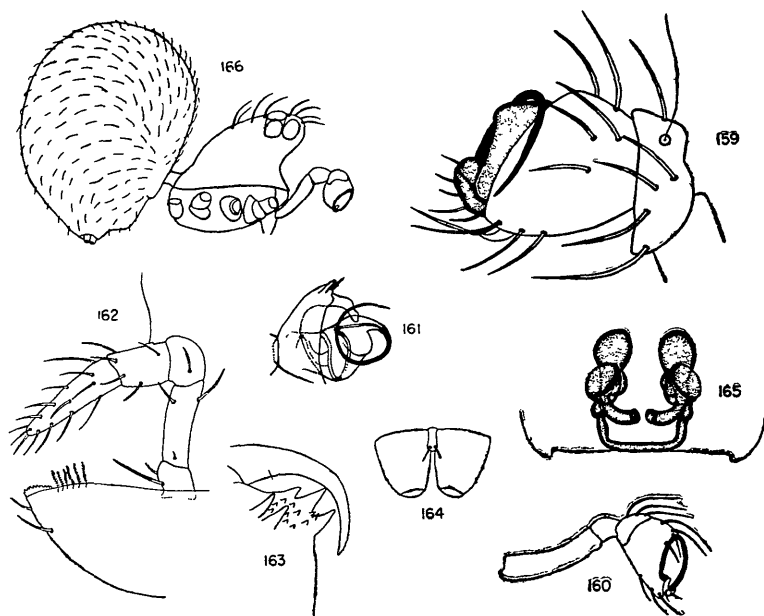
In general characters the female agrees with the male. The palp is reduced three segments (Fig 81) and is very small.

**TYPES**. Holotype male. Canterbury. Methven, ex leafmould, June 10, 1954, J. S. Dugdale, allotype female, Canterbury, Hoods Bush, Malvern Hills, ex moss, May 3, 1953, R. R. Forster (Holotype and allotype Canterbury Museum, paratype Otago Museum.)

RECORDS Canterbury: Lewis Pass, 2,000ft, ex moss, January 29, R. R. Forster; Okuku Pass, ex moss, April 6, 1952, J. S. Dugdale; Pukaratai, ex leafmould, June 19, 1946, A. J. Healy. Fiordland: Cascade Creek, ex moss, January 23, 1951, R. R. Forster, Manapouri, ex moss, January 23, 1951, R. R. Forster, Otago, Meads Landing, Lake Hawea, January 21, 1951, R. R. Forster.

# Genus *MYSMENA* Simon 1894

Levi (1956) has given an excellent extended diagnosis of this genus in his revision of the American species. The only character which may be found constant for this genus which was not mentioned by Levi is the presence of numerous small denticles on the surface of the cheliceral furrow between the pro- and retro-marginal teeth, which are present in all of the species which have been examined from the Pacific area.



TEXT-FIG 27—Figs 159–166 *Mysmena utiensis* n.sp. Fig 159—Prolateral surface of male palp Fig 160—Retrolateral surface of male palp Fig 161—Tarsus and bulb of male palp expanded Fig. 162—Female palp and maxilla Fig 163—Chelicera of female Fig 164—Anterior spinnerets and colulus Fig 165—Female internal genitalia Fig 166—Body of male from side

**Mysmena vitiensis** n sp (Figs 159-166)

MALE Measurements Carapace—Length, 0.25, width, 0.21, height, 0.19 Abdomen—Length, 0.39, width, 0.38

	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
Leg 1	0.24	0.09	0.22	0.14	0.17	0.86
Leg 2	0.21	0.08	0.21	0.13	0.16	0.79
Leg 3	0.16	0.07	0.13	0.18	0.13	0.67
Leg 4	0.18	0.10	0.14	0.14	0.13	0.69
Palp	0.11	0.03	0.04		0.10	0.28

**Colour** Entire animal uniform creamy-white

**Carapace** (Fig 166) Smooth, thoracic groove lacking Rising, evenly, from the posterior margin to the eye region where it is highest The eye region is produced forward so that it overhangs the clypeus

**Eyes** Eight, large, occupying most of the width of the head when viewed from above AME dark, others pale From above the posterior row appears slightly procurved, but from in front appears gently recurved Ratio of AME ALE PME PLE = 4.6:4.5 The lateral eyes and PME are grouped as two contiguous triads AME subcontiguous separated from each other by a distance equal to  $\frac{1}{2}$  the width of an AME and from the ALE by  $\frac{1}{2}$  of the width of an AME

**Chelicerae** Vertical, with three strong teeth on promargin and two on retromargin The area between the teeth with numerous small denticles

**Sternum** Convex, smooth, as wide as long, truncated posteriorly between coxae 4 Maxillae transverse, not meeting, Labium somewhat wider than long

**Palp** (Figs 159-161) Without processes Tibia with a single trichobothrium Cymbium provided with a distal curved projection Bulb simple with a singly coiled spinous embolus (Figs 160, 161)

**Legs** 1-2-4-3 Clothed with smooth hairs, legs 1-3 with three (2-1) trichobothria on tibia and one on metatarsus Leg 4 with four (1-2-1) trichobothria on tibia, none on metatarsus Three claws Tarsal drum proximal Femoral organ absent

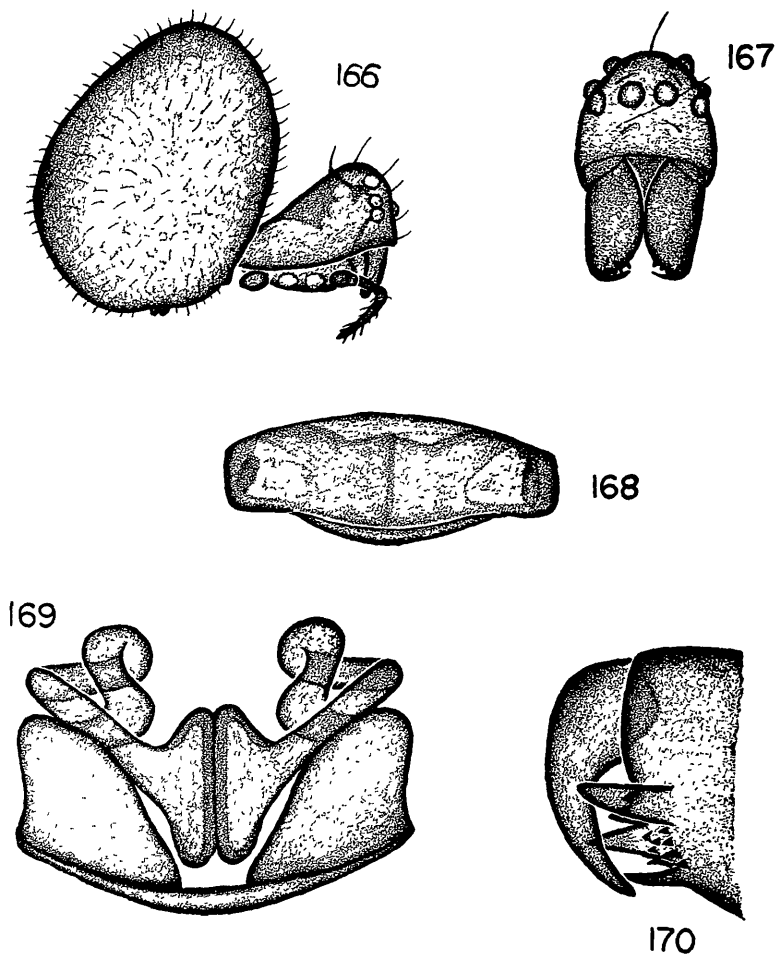
**Abdomen** Ovoid, clothed with smooth hairs, rising above the carapace Six spinnerets and prominent rod-like colulus (Fig 164) placed ventrally

FEMALE Measurements Carapace—Length, 0.37, width, 0.32, height, 0.22 Abdomen—Length, 0.75, width, 0.58

	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
Leg 1	0.27	0.11	0.18	0.12	0.15	0.83
Leg 2	0.26	0.10	0.19	0.14	0.12	0.81
Leg 3	0.23	0.10	0.15	0.15	0.13	0.76
Leg 4	0.24	0.11	0.17	0.15	0.13	0.80
Palp	0.05	0.02	0.03		0.05	0.15

Similar to male in general characteristics Palp lacking claw, with trichobothrium on tibia (Fig 162) External epigynum without scape Internal genitalia as in Fig 165

**TYPES** Holotype male, allotype female, paratypes, Fiji, Sawani, near Suva, found suspended from the end of fine silken threads on epiphytes, July 19, 1956, R. R. Forster (Holotype, allotype, Otago Museum, paratypes, Canterbury Museum)



TEXT-FIG 28—Figs 167–171—*Mysmena woodwardi* n. sp. Fig 167—Carapace and chelicerae from in front Fig 168—Female epigynum Fig 169—Female internal genitalia Fig 170—Chelicera of female Fig 171—Lateral view, body of female

**Mysmena woodwardi** n sp Figs 167-171

**FEMALE Measurements** Carapace—Length, 0.46, width, 0.43, height, 0.25 Abdomen—Length, 0.89, width, 0.84

	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
Leg 1	0.27	0.08	0.14	0.13	0.13	0.75
Leg 2	0.26	0.09	0.12	0.14	0.13	0.74
Leg 3	0.16	0.08	0.09	0.12	0.13	0.58
Leg 4	0.27	0.11	0.16	0.15	0.15	0.84
Palp	0.08	0.04	0.07		0.12	0.31

**Colour** Carapace reddish-brown with dark shading down the median surface Abdomen reddish brown with small pale spots along the lateral and anterodorsal surfaces Legs reddish brown

**Carapace** (Fig 171) Widest behind, narrowing anteriorly Thoracic groove lacking Highest in eye region, sloping steeply back to the posterior margin

**Eyes** (Fig 167) Eight, large, occupying most of the width of the head Ratio AME ALE:PME:PLE = 7.5:6.5 ALE separated from each other and ALE by  $\frac{3}{4}$  of the diameter of an AME Lateral eyes contiguous PME separated from each other by  $\frac{1}{2}$  of from the PLE by  $\frac{3}{4}$  of the diameter of an AME From in front the anterior row appears straight and the posterior row strongly recurved From above the posterior row is slightly procurved, while the anterior row is recurved Clypeus vertical slightly higher than the width of an AME

**Chelicerae** (Fig 170) Promargin with three strong teeth, of which the distal is bifid Retromargin with single tooth, proximal surface of groove armed with numerous denticles

**Sternum** Convex, smooth, almost as wide as long, truncated posteriorly Maxillae oblique, labium slightly wider than long

**Palp** Claw lacking Single trichobothrium present on tibia

**Legs** Ventral surface of metatarsus and tarsus of leg 4 with a ventral row of strongly serrate bristles, otherwise legs clothed with smooth hairs Legs 1-3 with three trichobothria on the tibia and one on the metatarsus Leg 4 without a metatarsal trichobothrium but with four (1 2 1) on tibia Tarsal drum proximal Three claws

**Abdomen** Ovoid, rising twice the height of the carapace, clothed with short hairs Six spinnerets with large triangular colulus furnished with two bristles Epigynum in form of a broad sclerotic plate, without scape Internal genitalia as in Fig 169

**TYPES** Holotype female, paratype female, New Guinea, Al Valley, Nomdugl, West Highlands, ex moss, rain forest, ca 6,500ft, T E Woodward (Holotype Queensland Museum, paratype Otago Museum)

**Mysmena samoensis** (Marples) 1955

1955 *Linyphia samoensis* Marples Proc Linn Soc London, Vol XLII, No 287, p 494, Pl 59, Figs 10, 14, 15, 16

This species, described from Upolu and Manona, Western Samoa, appears to be a typical *Mysmena* The original description for the species clearly characterises it, but I am able to add a few further details

The epigynum is provided with a long and slender scape A femoral spot is present on the femur of the first and second legs of the female There are a number of minute teeth on the distal surface of the cheliceral furrow near the base of the fang The anterior spiracles lead into short atria which are connected by a transverse duct From each atrium there are three bunches of tracheae which are limited to the abdomen There are two large posterior spiracles situated midway between the spinnerets and the epigastric groove, which open into atria The atria are connected transversely, and a bunch of tracheae passes from each atrium through the petiolus to the cephalothorax

**Mysmena phyllicola** (Marples)

1955 *Theridion phyllicolum* Marples Proc. Linn. Soc. London, Vol. XLII, No. 287, 488, Pl. 57, Figs. 13, 16, 22, Pl. 58, Fig. 1

This species appears to belong to *Mysmena*. It is interesting to note that the anterior spiracles lead into lungbooks which, however, are not typical and resemble those recorded by Levi (1956) for *Mysmena guttata*. There is a single posterior spiracle from which the tracheae are limited to the abdomen.

**Genus RISDONIUS** Hickman, 1938**Risdonius conicus** (Forster) 1951

1951 *Chasmocephalon concum* Forster Rec. Cant. Mus. 5 (4), p. 237, Fig. 134

Through the courtesy of Dr. V. V. Hickman, I have been able to examine specimens of *Risdonius parvus* from Tasmania which confirms the present generic placing of *conicus*. Hickman (1938) placed *Risdonius* in the Argiopidae because of the presence of the anterior pair of booklungs. A close examination of the respiratory system of both the Tasmanian and New Zealand species convinces me that this genus shows a transitory stage where the anterior respiratory system of *parvus* and *conicus* can be regarded either as attenuated booklungs or rudimentary tracheae. I have therefore placed this genus into the Symphytognathidae with which it conforms in most other characters.

The female internal genitalia of *R. conicus* is simple, consisting of a bilobed receptaculum as in *parvus*.

**Genus CHASMOCEPHALON** Cambridge, 1889

The type species for this genus is *Chasmocephalon neglectum* Cambridge, known from a single specimen collected at the Swan River, Western Australia. Cambridge records his specimen as a male from which both palps had been lost, but it is possible that it is a typical female. Six years later Simon (1895) described a further species *C. bimaculatum* from South Africa. Hickman (1944) has described *C. minutum* from Tasmania and the present author (Forster, 1951) *C. armatum* from New Zealand.

A close examination of the description and figures for *C. neglectum* suggests that this species may be congeneric with the Australian species which I have placed in *Pseudanapis*. If this is so it may be necessary after examination of Cambridge's type to establish a further genus for the Tasmanian and New Zealand species. It is probable that *C. bimaculatum* Simon from South Africa is not related to the Australian and New Zealand species, and after further study this species may be found to be better placed in another genus.

**Chasmocephalon armatum** Forster, 1951

1951 *Chasmocephalon armatum* Forster, Rec. Cant. Mus. 5 (4), p. 232

1951 *Chasmocephalon australis* Forster, Rec. Cant. Mus. 5 (4), p. 234, Fig. 142

Examination of the large series of specimens now available from a wide range of localities indicates that there is only one species in New Zealand. The spiders make a small orb web in moss and among loose leaf debris, and are usually found resting in the centre of the web. The New Zealand species is closely related to the Tasmanian *C. minutum* Hickman.

Originally recorded from Stokes Valley, Wellington, and Bench Island, Foveaux Strait, further records show it to be very widely distributed throughout New Zealand.

NEW RECORDS North Island—Wellington Gollans Valley, September 1, 1948, R. R. Forster, Silverstream, ex leafmould, May 20, 1950, R. K. Dell; Tararua Range, Judd Ridge, near Waterhole, ex leafmould, January 12, 1954, B. A. Hollo-way, Hawke's Bay Wallingford, February 12, 1948, G. Ramsay Taranaki Hurley-

ville, Patea, ex leafmould, January 10, 1950, D. H. Hurley, Taihape Reserve, ex leafmould, September 6, 1950, T. A. Moyle; Upper Rangitikei, May 8, 1948, J. Ramsay; Waikaremoana, Panekuri Bluff, 3,600ft, December 11, 1946, R. R. Forster; Stephen Island, May 19, 1950, R. R. Forster, same locality, ex leafmould, from the bases of Nikau Palms, near frog bank, December 1, 1953, B. A. Holloway; ex leafmould from scrub near frog bank, December 1, 1953, B. A. Holloway; Inner Chetwode Island, ex leafmould, September 12, 1948, J. T. Salmon; Motu Ngaratiti Island, ex leafmould, September 12, 1948, J. T. Salmon. South Island—Canterbury Lake Janet, ex leafmould, August 1, 1949, R. R. Forster, Okuku Pass, ex leafmould, August 7, 1949, F. McGregor, March 30, 1952, J. S. Dugdale; Okuti Valley, December 12, 1950, R. R. Forster, Cooper's Creek, ex moss, October 18, 1953, R. R. Forster; Fox's Creek, April 27, 1952, J. S. Dugdale, Kaituna Valley, ex leafmould, August 14, 1950, R. Jacobs, Kennedy's Bush Christchurch, January 12, 1944, J. T. Salmon. Creek east of Dog Hill, tributary of Hurunui River, ex moss, May 12, 1952, J. S. Dugdale; Mount Algidus, ex leafmould, February 12, 1946, R. R. Forster; Cass, July 10, 1949, R. R. Forster; Lewis Pass, 2,200ft, ex moss, January 29, 1956, R. R. Forster, Arthur's Pass, ex moss, December 9, 1949, R. R. Forster. Westland Camerons, September 5, 1950, R. A. Chapman. Fiordland—North side of Lake Manapouri ex leafmould, February 6, 1946, R. R. Forster, Lake Poteriteri, ex moss, February 9, 1955, G. Ramsay. Southland—Orepuki, May 9, 1949, R. R. Forster, Longwood Range, ex leafmould, September 1, 1948, J. H. Sorensen; March 14, 1948, G. C. Weston; Crest between Crombie and Wairaurahiri Rivers, ex leafmould, May 28, 1948, G. C. Weston, Bluff, ex leafmould, May 19, 1949, J. H. Sorensen. Stewart Island Horseshoe Bay, November 21, 1946, R. R. Forster. Codfish Island ex leafmould, July 16, 1948, C. Lindsay.

#### Genus PSEUDANAPIS Simon, 1905

##### *Pseudanapis insula* (Forster, 1951)

1951 *Chasmocephalon insulum* Forster Rec Cant Mus 5 (4), p 242, Fig 153

This species was originally described from a single male from Little Barrier Island.

The female is similar to the male in general characteristics, but the dorsal scute is lacking, the palp is absent and the first leg is without spines. I consider that the species is more correctly placed in *Pseudanapis*.

NEW RECORDS North Auckland Waipoua, January, 1952, W. R. McGregor, Coromandel, Te Hope-Moehau Track, ex leafmould, January 17, 1952, T. E. Woodward

##### *Pseudanapis spinipes* (Forster, 1951)

1952 *Chasmocephalon spinipes* Forster Rec Cant Mus 5 (4), p 239 Fig 151

Originally recorded from Akatarawa Divide and Stokes Valley, Wellington, the present collections increase the range of this species to include both the North and South Islands

NEW RECORDS North Island—Wellington Waikane, January 3, 1948, R. R. Forster, Gollans Valley, September 1, 1948, R. R. Forster, Waikato, Onepuku, November 20, 1954, R. R. Forster; Feilding, ex leafmould, January 16, 1952, R. R. Forster, North end of Manawatu Gorge, ex leafmould, December 15, 1946, R. R. Forster, Waikaremoana, Mt Ngamoko, 2,500ft, ex leafmould, December 13, 1946, R. R. Forster, Waikaremoana, Ngamoko Track, ex foliage, December 20, 1946, R. R. Forster. South Island—Canterbury Methven, ex leafmould, June 10, 1954, J. S. Dugdale, Kowai Bush, May 18, 1952, J. S. Dugdale, Dean's Bush, Christchurch, December 19, 1949, J. S. Dugdale, Peel Forest, January 20, 1951, R. R. Forster, Cooper's Creek, ex leafmould, December 3, 1948, R. R. Forster



***Pseudanapis burra* n sp. Figs. 82–87.**

MALE Measurements: Carapace—Length, 0.67, width, 0.54, height, 0.50. Abdomen—Length, 1.21, width, 0.62

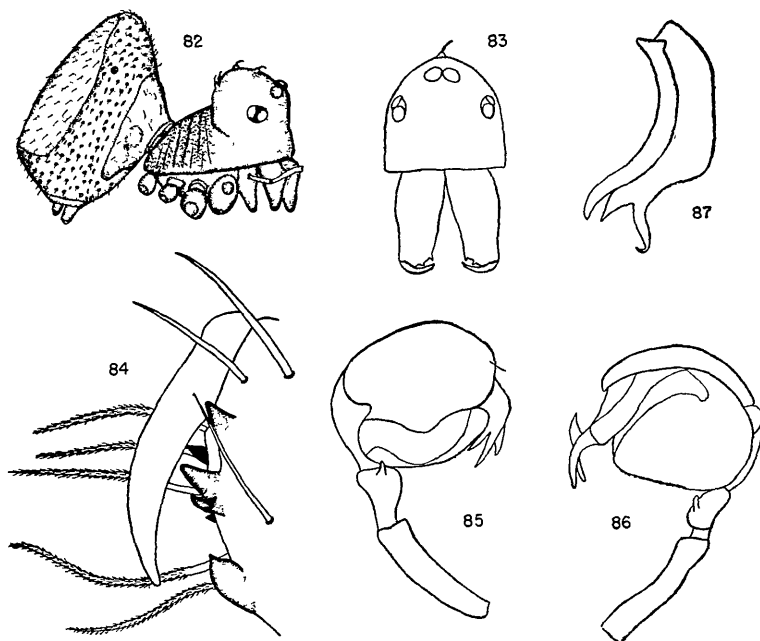
	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
Leg 1	0.84	0.26	0.74	0.26	0.53	2.63
Leg 2	0.58	0.26	0.53	0.16	0.47	2.00
Leg 3	0.37	0.16	0.26	0.16	0.37	1.32
Leg 4	0.58	0.21	0.42	0.17	0.42	1.80

*Colour* Carapace and scutes deep reddish-brown, abdomen grey. Legs paler brown.  
*Carapace* (Fig. 82) Head region higher, evenly rounded with a few setose postules, but otherwise smooth. Thorax granulate with shallow median depression.

*Eyes* (Fig. 83). Six, placed in three contiguous pairs. From in front the posterior row appears strongly procurved, from above it appears slightly procurved. Ratio of ALE/PME = 10.9/10. The lateral eyes are situated on a definite lobe. PME separated from the PLE by 14/10 and from the ALE by 12/10 of the diameter of a PME. Clypeus vertical, height equal to three times the diameter of an ALE.

*Chelicerae* (Fig. 84) Vertical with slight proximo-ventral swellings. Retromargin with three teeth of which the median is bifid, promargin with a median group of three smaller teeth, fused at the base. There is a row of five setose hairs above the promargin.

*Sternum* Convex, granulate, almost oval in outline, separating coxae IV by a distance equal to twice their width. Maxillae transverse, twice as long as wide. Labium fused to



TEXT-FIG. 15.—Figs. 82–87—*Pseudanapis burra* n sp. Fig. 82—Side view of male. Fig. 83—Front view of carapace and chelicerae showing eyes. Fig. 84—Chelicera of male. Fig. 85—Retrolateral surface of male palp. Fig. 86—Prolateral surface of male palp. Fig. 87—Male bulb processes from above.

sternum, twice as wide as long. The sternum is joined with the carapace by strips between the coxae of the legs and a strip passes anteriorly between the chelicerae and maxillae.

**Palp** (Figs 85, 86). Patella with a small sharp process on the distal retrolateral surface. Bulb large, simple with two distal processes, one (embolus?) simple and the other (conductor?) distally bifid.

**Legs 1 2 4 3**. Relatively stout. Femora of legs, 1 and 2 with pustules along the ventral surface. There is a row of short, stout spines along the entire proventral surface of the metatarsus and tarsus and two on the proventral surface of the tibia. Legs 1-3 with three trichobothria.

**FEMALE Measurements**. Carapace—Length, 0.71, width, 0.58, height, 0.51. Abdomen—Length, 1.12, width, 0.76.

	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
Leg 1	0.69	0.23	0.67	0.23	0.50	2.32
Leg 2	0.56	0.18	0.51	0.18	0.48	1.91
Leg 3	0.40	0.13	0.31	0.14	0.39	1.37
Leg 4	0.50	0.16	0.42	0.16	0.42	1.66

Similar to male in general structure. Abdomen lacking a dorsal plate, greyish with irregular cream patches down the dorsal surface.

**TYPES**. Holotype male, Queensland, Binna Burra, Lamington Plateau ex leaf-mould, rain forest, August 28, T. E. Woodward, allotype female, same locality, September 7, 1952, paratype female, Ballungui Track, near Binna Burra, ex leaf-mould, October 30, 1955, T. E. Woodward. (Holotype and allotype in Queensland Museum, paratype Otago Museum.)

#### ***Pseudanapis octocula* n. sp. (Figs 88-91)**

**MALE Measurements**. Carapace—Length 0.58, width, 0.46, height, 0.44. Abdomen—Length, 1.21, width, 0.84.

	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
Leg 1	1.00	0.21	1.00	0.31	0.69	3.21
Leg 2	0.63	0.15	0.58	0.26	0.47	2.09
Leg 3	0.41	0.13	0.26	0.16	0.37	1.33
Leg 4	0.53	0.16	0.42	0.19	0.37	1.67

**Colour**. Cephalothorax, legs and abdominal scutes reddish brown. Soft portion of abdomen creamy grey.

**Carapace** (Fig. 88). Head region high and smooth. When viewed from the side the dorsal surface somewhat flattened but sloping steeply posteriorly to the thoracic groove, which is deep in the middle line but shallow laterally. Thoracic region granulate, with a shallow median depression.

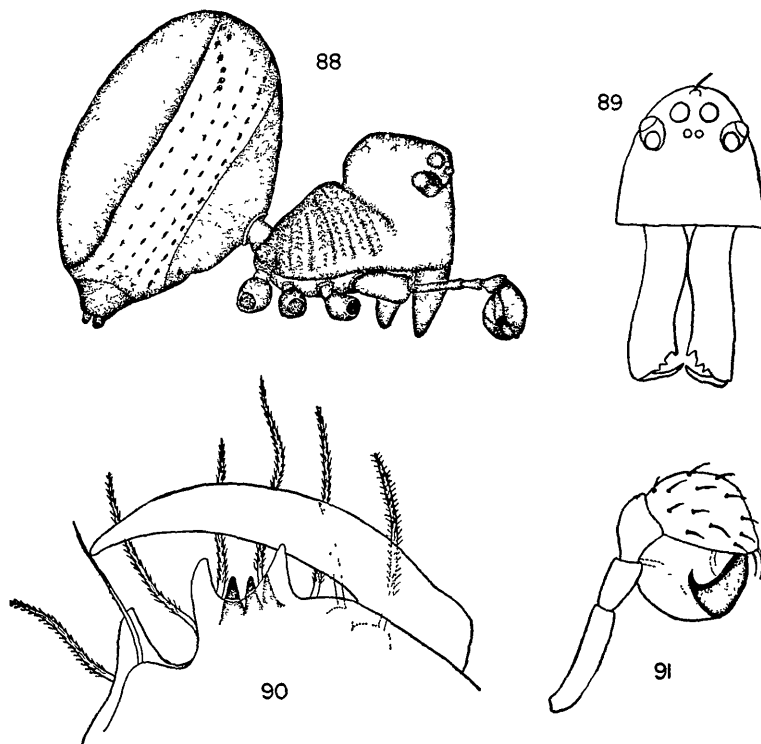
**Eyes**. Eight. From in front the anterior row is strongly procurved. Ratio of AME:ALE:PME:PLE = 2.6:6.6:6. The AME are separated from each other and from the PME by a distance equal to  $\frac{2}{3}$  of the diameter of an AME. The distance between the AME and ALE is equal to  $\frac{5}{2}$  of the diameter of an AME. The PME are separated from each other by a distance equal to and from the PLE by  $\frac{7}{4}$  of the diameter of an AME. Laterals contiguous.

**Chelicerae** (Fig. 90). Relatively long, vertical, slightly bowed when viewed from in front with three small contiguous teeth on mid promargin and three stronger, widely separate teeth on retromargin.

**Sternum**. Convex, granulate, almost oval in outline, slightly longer than wide. Coxae 4 separated by twice their width. Maxillae transverse twice as long as wide. Labium fused.

**Legs 1 2 4 3**. Slender, clothed with small hairs, spines lacking. Legs 1-3 with three (2.1) trichobothria on tibia, one on metatarsus. Leg 4 with four (1.2.1) trichobothria on tibia and none on metatarsus. Three smooth claws, with false claws on legs 3 and 4. Tarsal drum proximal.

**Palp** (Fig. 91). Processes lacking. Bulb simple, embolus as broad plate over distal surface, narrowing to a sharp point on the retrolateral surface. Abdomen ovoid, spinnerets ventral, rising well above carapace. Dorsal and ventral plates both well developed. Ventral scute



TEXT-FIG 16—Figs 88–91—*Pseudanapis octocula* n.sp. Fig 88—Body of male from side. Fig 89—Carapace and chelicerae from in front showing the eyes. Fig 90—Male chelicera. Fig 91—Retrolateral surface of male palp.

encircles the petiolus extends dorsally. The tracheal spiracles open a short distance from the posterior margin of the ventral scute. There are a series of small sclerotic plates along the lateral surface. Six spinnerets and colulus surrounded by a broad sclerotic band.

FEMALE. Measurements. Carapace—Length, 0.55, width, 0.46, height, 0.44. Abdomen—Length, 1.19, width, 0.84.

	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
Leg 1	0.85	0.21	0.79	0.32	0.58	2.75
Leg 2	0.63	0.21	0.53	0.21	0.47	2.05
Leg 3	0.37	0.16	0.32	0.16	0.37	1.38
Leg 4	1.01	0.17	0.42	0.18	0.37	2.15

Similar in appearance to male, with both dorsal and ventral plates. Palp lacking.

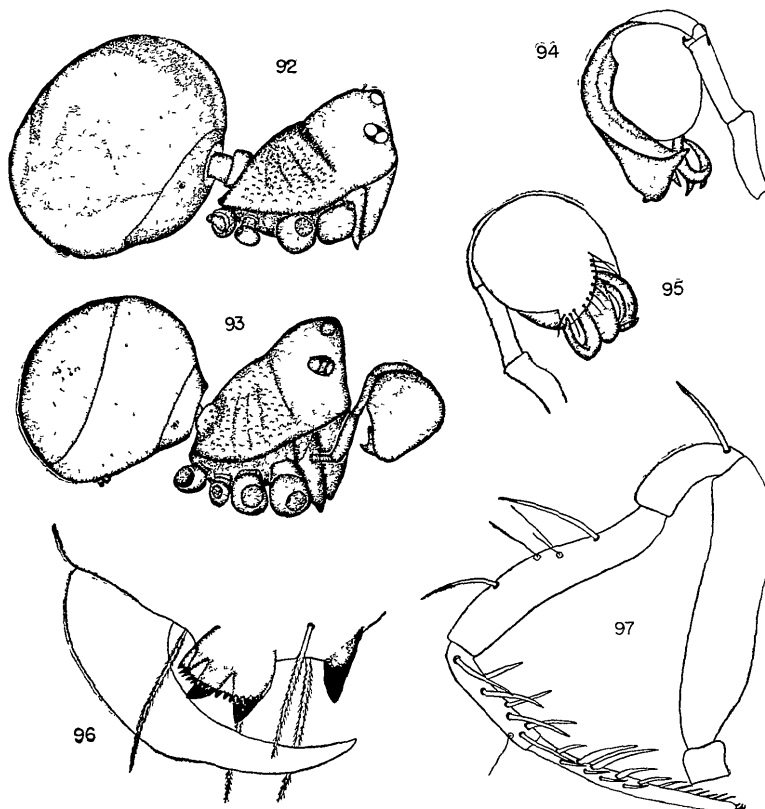
TYPES. Holotype male, paratype males, Queensland, Binna Burra, ex leafmould, September 7, 1952, T. E. Woodward, allotype female, Sunnybank, Brisbane, October 5, 1955, W. Haseler. (Holotype, allotype, Queensland Museum, paratype, Otago Museum.)

***Pseudanapis darlingtoni* n sp (Figs 92-97)**

MALE Measurements Carapace—Length, 0.54, width, 0.54, height, 0.40 Abdomen—Length, 0.75, width, 0.62

	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
Leg 1	0.58	0.21	0.53	0.32	0.58	2.22
Leg 2	0.56	0.18	0.37	0.21	0.47	1.79
Leg 3	0.32	0.16	0.21	0.21	0.32	1.22
Leg 4	0.37	0.17	0.32	0.22	0.37	1.45
Palp	0.16	0.21	0.21		0.31	0.89

Colour Carapace, legs and scutes deep reddish brown Abdomen bluish-grey, with irregular pale dorsal patches



TEXT-FIG 17—Figs 92-97—*Pseudanapis darlingtoni* n sp Fig 92—Body of female from side Fig 93—Body of male from side Fig 94—Prolateral surface of male palp Fig 95—Retro-lateral surface of male palp Fig 96—Male chelicera Fig 97—Prolateral surface of leg 1 of male

*Carapace* (Fig 93) Head highest in eye region, sloping gently back to thoracic region, subconical when viewed from the side, without well defined thoracic groove

*Eyes* Six, in three pairs, lateral eyes contiguous, placed on a low tubercle median pair subcontiguous When viewed from above the posterior row is gently recurved, from in front it appears procurved Ratio of ALE:PME:PLE = 7:6:6 The ALE are separated from each other by five times the diameter of an ALE PLE separated from PME by distance equal to almost twice the width of an ALE Clypeus vertical, height equal to three times the diameter of an ALE.

*Chelicerae* (Fig 96) Vertical, without bosses Broad serrate process on promargin, three strong teeth on retromargin and a further strong tooth at a proximal limit of the furrow

*Sternum*. Convex, coriaceous, almost oval in outline, slightly longer than wide Posterior margin rounded and separating coxae IV by a distance equal to twice their width Maxillae directed across the body, twice as long as wide. Labium fused.

*Legs* 1 2 4 3 Relatively stout, clothed with smooth hairs There are bristles on the dorsal surfaces of the patellae and tibiae Leg 1 with a series of spines along the prolateral and ventral surface of the metatarsus and tarsus and the distal prolateral surface of the tibia There are smaller spines on the prolateral surfaces of the tibia and metatarsus of leg 2 (Fig 97) There are three (2-1) trichobothria on the median surface of the tibia of legs 1-3 and a single trichobothrium at  $\frac{2}{3}$  of the length of the metatarsi Leg 4 with four (1 2 1) trichobothria on tibia, but absent from metatarsus Three claws, all of which appear to be smooth Tarsal drum proximal

*Palp* (Figs 94, 95) Patella with a thin expanded plate on the distal prolateral surface produced to short point ventrally Bulb large, conductor and embolus as in Fig 95 Tarsus with a sharp distal process

*Abdomen* Subspherical, spinnerets ventral Ventral scute short, encircling petiolus, dorsal scute well developed, posterior in position Six short spinnerets and small colulus in compact group Mammillary ring absent

**FEMALE** Measurements Carapace—Length, 0.58, width, 0.48, height, 0.39 Abdomen—Length, 0.75, width, 0.67

	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
Leg 1	0.58	0.21	0.43	0.32	0.42	1.96
Leg 2	0.32	0.16	0.42	0.21	0.42	1.53
Leg 3	0.26	0.16	0.32	0.16	0.32	1.22
Leg 4	0.42	0.21	0.32	0.16	0.42	1.53

With the general characters of the male, but the head region appears to be more rounded Abdomen without dorsal scute, ventral scute extending posteriorly Palp absent

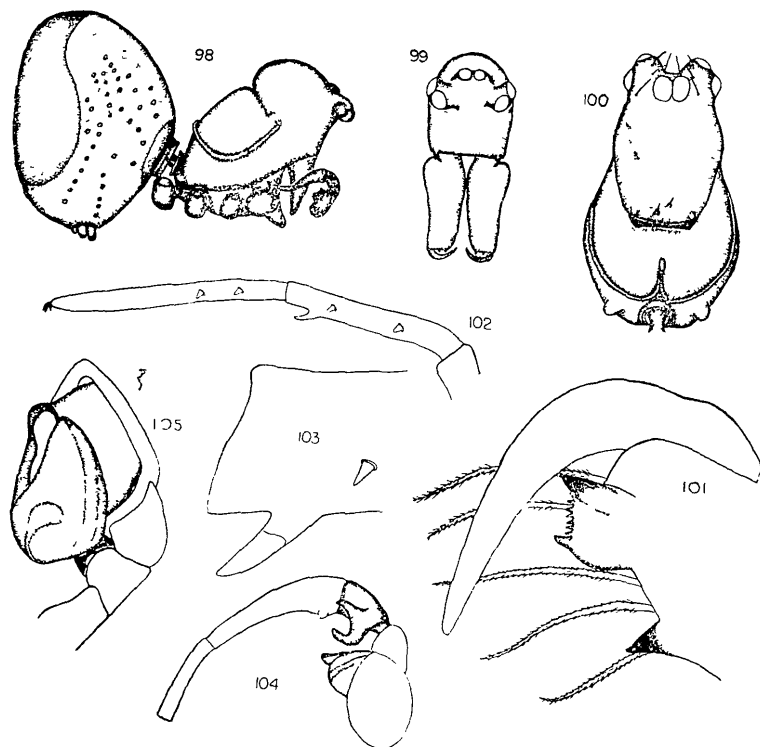
**TYPES** Holotype male, allotype female and paratypes, North Queensland, Mount Spurgeon, July 1932, P. J. Darlington Holotype and allotype, Museum of Comparative Zoology, Cambridge, Mass., paratypes, Queensland Museum, Otago Museum.

#### *Pseudanapis grossa* n sp (Figs 98-105)

**MALE** Measurements Carapace—Length, 1.09, width, 0.75; height, 0.54 Abdomen—Length, 1.24, width, 0.84.

	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
Leg 1	1.06	0.32	0.90	0.42	0.63	3.33
Leg 2	0.58	0.21	0.47	0.26	0.42	1.94
Leg 3	0.58	0.16	0.32	0.21	0.42	1.69
Leg 4	0.79	0.26	0.58	0.32	0.53	2.48
Palp	0.28	0.09	0.10		0.15	0.62

*Colour* Cephalothorax and abdominal scutes deep reddish-brown Legs paler brown Abdomen blackish grey except for the pale dorsal area and a few pale spots



TEXT-FIG. 18—Figs 98–105—*Pseudanapis grossa* n.sp. Fig 98—Body of male from side Fig 99—Carapace and chelicerae from in front, showing eyes Fig 100—Carapace from above Fig 101—Male chelicera Fig 102—Metatarsus and tarsus showing spur Fig 103—Retro-lateral surface male palp Fig 104—Prolateral surface male palp Fig 105—Prolateral surface male palp

**Carapace** (Figs 98, 100) Smooth, head region rounded, much higher than thoracic region, with a prominent lobe on each anterior dorsal margin which bears the lateral eyes. Thoracic groove deep, limited to the median surface. There is a prominent ridge extending from below the head back down the thorax on each side near the lateral margins and curving in to the median line posteriorly where it extends forward as a single ridge to a point midway between the posterior margin of the thorax and the thoracic groove. There is a rounded lobe on each posterior corner of the thorax.

**Eyes** (Fig 99) Six in three pairs. The lateral eyes are contiguous and are placed on a large prominent protuberance. Median eyes contiguous. When viewed from above, the posterior row is almost straight, from in front it appears strongly procurved. Ratio of ALE:PME:PLE = 10:9:11. The ALE are separated from each other by a distance equal to  $1\frac{1}{2}$  the diameter of an ALE, while the PLE are separated from the PME by a distance equal to the diameter of an ALE.

**Sternum** Slightly convex, joined to carapace by sclerotic strips passing between the coxae. Maxillae transverse and differentiated from broad band which passes from coxal anteriorly separating the chelicerae and maxillae. The pedipalps are inserted on this band. There is a stout erect spine on the undersurface of the maxillae. The posterior margin of the sternum is rounded and separates coxae IV by a distance equal to their width.

**Chelicerae** (Fig 101) Vertical, with a rounded swelling on the proximo-dorsal surface which abuts onto a small lobe on each anterior corner of the carapace. Promargin with a

strong tooth on both proximal and distal extremities Retromargin with a broad serrate process

*Palp* (Figs 104, 105) Trochanter and femur slender, elongate There is a small rounded lobe on the distal retrolateral surface of the femur and a prominent bifurcate process on the prolateral surface of the patella Bulb simple, embolus slender, conductor absent

*Legs* 1 4 2 3 Leg 1 with a sharp spur on the disto-ventral surface of the metatarsus and two short spines on the distal proventral surface of the metatarsus and the proximal proventral surface of the tarsus (Figs 102, 103) Legs 1-3 with 3 (1 1 1) trichobothria along the median surface of tibia and one on metatarsus Leg 4 with four (1 2 1) on tibia, metatarsus none Three claws, smooth, inferior long and slender Tarsal organ proximal

*Abdomen* Ovoid, spinnerets ventral, rising higher than carapace Ventral scute small, encircling the petiolus Dorsal scute large, posterior in position Clothed with short hairs, which do not have conspicuous basal sclerites, but with a number of small round, non setose sclerites on the lateral surfaces

Six short spinnerets and colulus in a compact group, without mammillary ring

**TYPE** Holotype male, New Guinea, Gomomgu Valley, Ramu-Purari Divide ca 3 miles S.W. of Mount Otto, Central Highlands, 7,500ft, August 18, 1956, T. E. Woodward. (Holotype, Queensland Museum)

*Pseudanapis aloha* n sp (Figs 106-110)

**MALE** Measurements Carapace—Length, 0.75, width, 0.71, height, 0.53 Abdomen—Length, 0.96, width, 0.85

	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
Leg 1	0.31	0.08	0.22	0.11	0.25	0.97
Leg 2	0.25	0.07	0.19	0.09	0.21	0.81
Leg 3	0.19	0.07	0.16	0.09	0.20	0.71
Leg 4	0.25	0.07	0.20	0.10	0.23	0.85
Palp	0.08	0.07	0.04		0.12	0.31

*Colour* Carapace, sternum and abdominal scutes yellow-brown. Legs paler brown Unscerotised portions of the abdomen pale yellow

*Carapace* (Fig 106) Slightly longer than wide Lateral margins of thorax and head coarsely punctate Posterior slope of thorax granulate, dorsal surface of head smooth and shiny The thoracic region slopes steeply back, with low lateral shoulders Cephalic groove shallow, but clearly defined Head gently rounded, highest in the region of the eyes

*Eyes* (Fig 107) Six Ratio of ALE PME PLE = 6 5 6 Lateral eyes and PME as contiguous pairs When viewed from above the posterior row is gently procurved PME separated from the PLE by a distance equal to the diameter of a PME Clypeus, vertical, height equal to twice the diameter of the PME

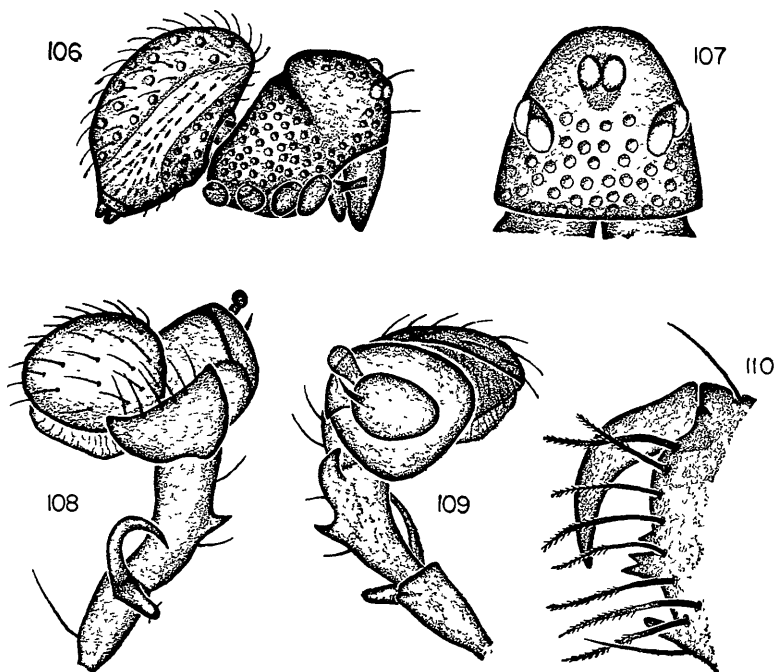
*Sternum* Convex, coarsely punctate, joined to carapace by strips between the coxae Broadly obtuse and gently rounded posteriorly between coxae 4 which are separated by a distance equal to almost twice their width Labium fused to sternum, almost twice as wide as long Maxillae transverse, narrowing to a sharp point distally

*Chelicerae* (Fig 110) With a pronounced proximo-dorsal swelling Promargin with a three closely spaced teeth on the median surface and a single proximal tooth Retromargin smooth There is a row of eight ciliate hairs along the proventral surface

*Palp* (Figs 108-109) Femur short, with strong distodorsal bifid process Patella elongate with a small median dorsal spine and a stronger distodorsal sinuous process Cymbium oval, bulb as figured

*Legs* 1 4 2 3 Spines lacking Clothed with smooth hairs, except for a few on the ventral surfaces of the tarsi, which are finely serrate There are three (2 1) trichobothria on the dorsal surfaces of the tibia of all legs and a single trichobothrium on the metatarsus of legs 1-3 Tarsal drum proximal Three claws, with two false claws Superior claws with a single ventral tooth

*Abdomen* Dorsal and ventral scutes well developed, both with scattered punctures Dorsal plate clothed with relatively long, smooth hairs Soft portions of the abdomen with longitudinal rows of small sclerotic plates Six spinnerets and a small colulus enclosed by a prominent sclerotic ring There appears to be no posterior spiracle. The two anterior spiracles open at the notches on the posterior lateral margins of the ventral scute



TEXT-FIG 19—Figs 106–110—*Pseudanapis aloha* n sp Fig 106—Side view body of male Fig 107—Carapace of male from in front, showing eyes Fig 108—Retrolateral surface of male palp Fig 109—Prolateral surface of male palp Fig 110—Male chelicera

TYPE. Holotype male Hawan, in collection, American Museum of Natural History, New York.

*Pseudanapis wilsoni* n sp (Figs 111–117)

MALE Measurements Carapace—Length, 0.32, width, 0.29, height, 0.31 Abdomen—Length, 0.52, width, 0.46

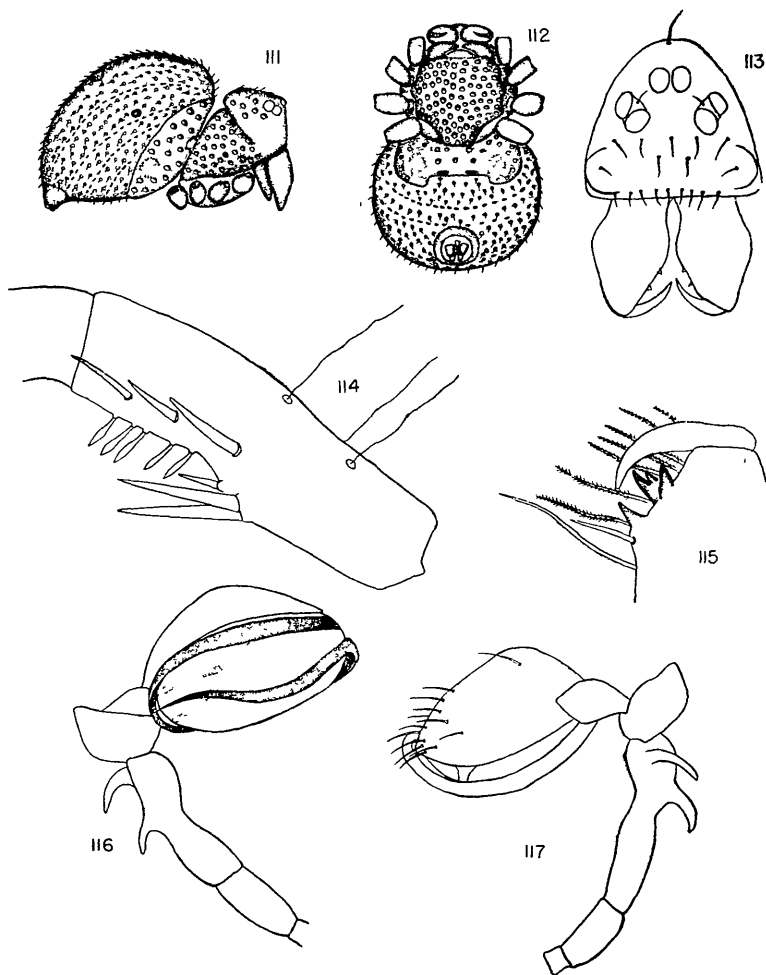
	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
Leg 1	0.26	0.10	0.26	0.11	0.26	0.99
Leg 2	0.26	0.09	0.21	0.11	0.25	0.92
Leg 3	0.21	0.08	0.21	0.11	0.23	0.84
Leg 4	0.31	0.10	0.24	0.23	0.24	1.02

Colour Cephalothorax, appendages and scutes dark reddish brown Soft portions of abdomen grey

*Carapace.* There are numerous punctures on the thoracic region and the dorsal surface of the head region The head is somewhat higher than the thorax and from the side appears gently rounded, almost flat Thoracic groove deep mesially, shallow laterally where it can be traced almost to the lateral margins The thoracic region slopes steeply down to the posterior margin.

*Eyes* (Fig 113) Six in three contiguous pairs When viewed from above the posterior row is almost straight, when viewed from in front strongly procurved Ratio of ALE PME PLE





TEXT-FIG 20—Figs 111–117—*Pseudanapis wilsoni* n. sp. Fig 111—Side view body of female  
 Fig 112—Ventral view body of female Fig 113—Carapace and chelicerae from in front,  
 showing eyes Fig 114—Tibia of leg 1 of male Fig 115—Male chelicera Fig 116—Pro-  
 lateral surface of male palp Fig. 117—Retrolateral surface of male palp

= 6.5.6 ALE separated from each other by a distance equal to 8/6 of the diameter of an ALE ALE separated from the PLE by a distance equal to 3/6 of the diameter of an ALE

*Chelicerae* (Fig. 115) Vertical, with a tricuspid tooth on the retromargin and a single tooth on the proximal promargin There is a row of six ciliate hairs above the promargin and a further two similar hairs on the mid prolateral surface

*Sternum* Convex, coarsely punctate, scutiform, broadly obtuse posteriorly, separating coxae IV by distance equal to twice their width Maxillae transverse Labium fused, twice as wide as long.

*Palp* (Figs 116, 117) Femur with two strongly curved spinous processes, one dorsal at two-thirds, and one on the subdistal prolateral surface Patella somewhat flattened and projecting dorsally above the femur Bulb simple, embolus long and ribbonlike, coiled  $1\frac{1}{2}$  times round the bulb, terminating with a sharp point at the posterior retrolateral surface Conductor absent.

*Legs* Clothed with smooth hairs Tibia of leg 1 with three spines on the mid-ventral surface, two large and one small, followed by a ventral row of four spatulate spines and a proventral row of three normal spines (Fig. 114) Tibia of leg 2 with four ventral spines Tibia of all legs with three trichobothria (2 1), metatarsi 1-3 with a single median trichobothrium Tarsal drum proximal Three claws, smooth

*Abdomen* Ovoid Dorsal and ventral scutes present, dorsal scute smooth, ventral scute coarsely punctate, clothed with short hairs which rise from small sclerotic plates Six spinnerets with colulus surrounded by a sclerotic ring

**FEMALE** Measurements Carapace—Length, 0.33, width, 0.32, height, 0.31 Abdomen—Length, 0.52, width, 0.56

	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
Leg 1	0.24	0.09	0.26	0.09	0.23	0.91
Leg 2	0.24	0.08	0.21	0.08	0.22	0.83
Leg 3	0.19	0.06	0.19	0.07	0.19	0.70
Leg 4	0.26	0.08	0.28	0.09	0.21	0.92

Dorsal scute absent but dorsal surface somewhat coriaceous Internal genitalia simple Abdomen consisting of a simple sac with a number of conspicuous round sclerotic plates near the lateral margins of the scute Pedipalps lacking Legs without spines

**TYPES.** Holotype male, allotype female, paratype female, New Guinea, Lower Busu River, Huon Peninsula, 1955, E. O. Wilson, ex leafmould lowland rain forest Holotype and allotype, Museum of Comparative Zoology, Cambridge, Mass., paratype, Otago Museum

#### Genus *PATU* Marples, 1951

This genus is closely related to *Symphytognatha*, from which it is mainly separated by the form of the chelicerae teeth Marples (1951) has recorded two species, *P. vittensis* from Fiji and *P. samoensis* from Samoa Two further species are described below, *P. marplesi* from Samoa and *P. woodwardi* from New Guinea

*Patu woodwardi* n sp (Figs 118-123)

**MALE** Measurements Carapace—Length 0.19, width, 0.18, height, 0.15 Abdomen—Length, 0.33, width, 0.34

	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
Leg 1	0.15	0.08	0.12	0.12	0.15	0.62
Leg 2	0.13	0.07	0.11	0.08	0.11	0.50
Leg 3	0.12	0.06	0.09	0.05	0.10	0.42
Leg 4	0.15	0.08	0.11	0.07	0.11	0.52
Palp	0.03	0.02	0.06		0.09	0.20

**Colour** Body and appendages dark grey, without markings

**Carapace** (Fig 118) Rising steeply from the posterior margin of the carapage, highest in the region of the eyes Thoracic groove absent, smooth apart from a few hairs on the dorsal head region

**Eyes** (Fig 119) Six, relatively large From above the posterior row is almost straight, from in front it appears strongly procurved Ratio of ALE:PME:PLE = 3:4:3 The PME are separated from each other and from the PLE by a distance equal to one-half of the width of a PME Lateral eyes contiguous, placed on a definite tubercle Clypeus slightly concave, equal in height to the diameter of a PME

**Chelicerae** (Fig 122) Vertical small, with a single stout tooth at the base of the fang

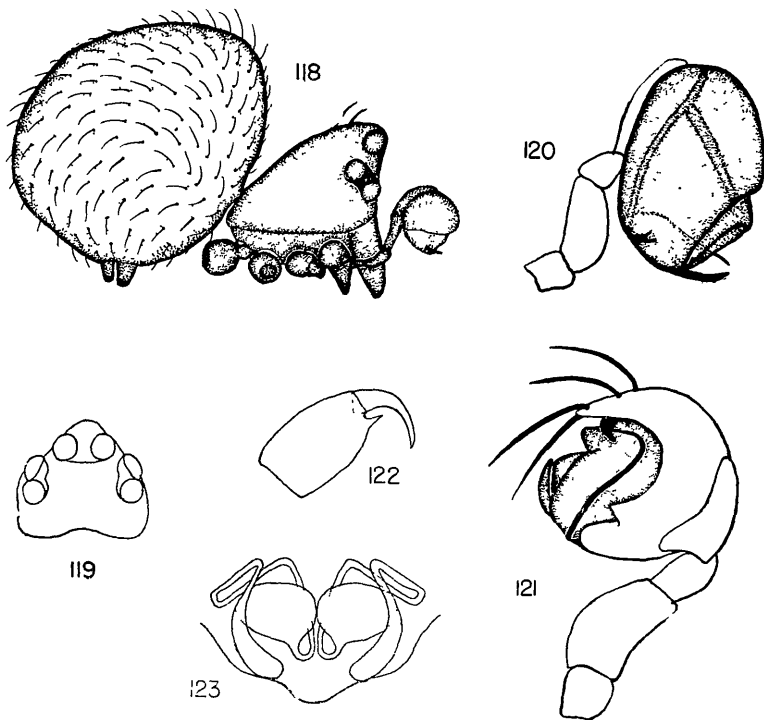
**Sternum** Convex, smooth and shiny Almost as wide as long, obtuse behind where it separates the fourth pair of coxae by a distance equal to twice their width Maxillae converging but not meeting in the midline Labium wider than long

**Palp** (Figs 120–121) Without lobes or processes Tarsus twisted so that bulb is retrolateral Embolus slender, coiled around prolateral surface to a short spinous conductor which is situated dorsally There is a further short spinous structure ventrally

**Legs** 1–2–3 Clothed with smooth hairs and bristles present on the dorsal surfaces of patella and tibiae Spines lacking Trichobothria present only on the tibiae of all legs Three (1–2) on tibiae 1–3, four (1–2–1) on tibia 4 Tarsal drum proximal Three claws, all of which appear smooth

**Abdomen** (Fig 118) Globose, clothed with slender smooth hairs Six spinnerets with large colulus, ventral in position

**FEMALE Measurements** Carapace—Length, 0.23, width, 0.21, height, 0.13 Abdomen—Length, 0.38, width, 0.36



TEXT-FIG 21—Figs 118–123—*Patu woodwardi* n.sp. Fig 118—Side view, body of male Fig 119—Carapace from in front, showing eyes Fig 120—Retrolateral surface of male palp Fig 122—Male chelicera Fig 123—Internal genitalia, female

	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
Leg 1	0 21	0 06	0 14	0 08	0 15	0 64
Leg 2	0 13	0 05	0 09	0 05	0 11	0 43
Leg 3	0 11	0 05	0 08	0 04	0 08	0 36
Leg 4	0 17	0 07	0 11	0 05	0 11	0 51

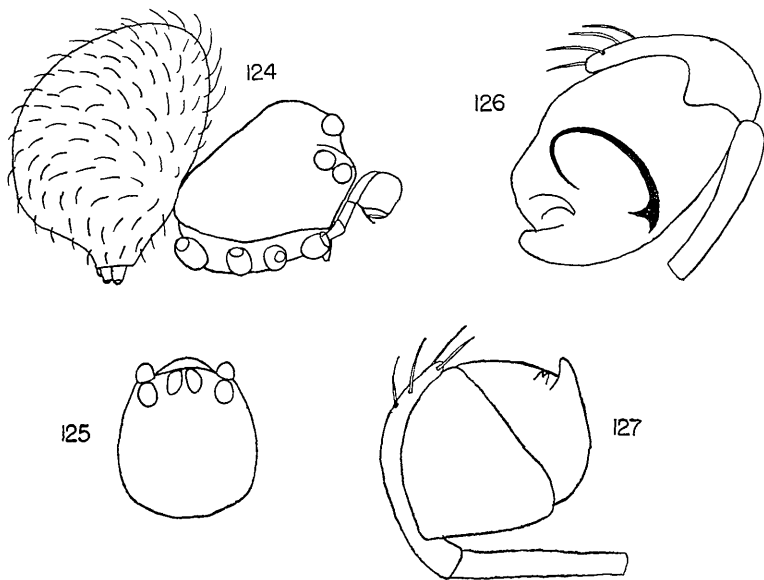
Very similar to the male in most characters. The palp is completely absent. Internal genitalia as shown in Fig. 123. Legs 4, 1, 2, 3.

**Types.** Holotype female, paratype female, New Guinea, Lae, ex leafmould rain forest, August 6, 1956, T. W. Woodward, allotype male, Benage, ca. 20 miles S W of Aiyura, East Highlands, ca. 6,000ft ex leafmould rain forest, August 1, 1956, T. E. Woodward. Holotype female, allotype male in Queensland Museum; paratype female in Otago Museum.

***Patu marplesi* n. sp.** (Figs 124-127)

**MALE Measurements.** Carapace—Length, 0 22, width, 0 22, height, 0 13. Abdomen—Length, 0 21, width, 0 22.

	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
Leg 1	0 21	0 06	0 14	0 08	0 15	0 64
Leg 2	0 17	0 05	0 11	0 08	0 14	0 55
Leg 3	0 12	0 05	0 08	0 06	0 12	0 43
Leg 4	0 16	0 06	0 12	0 07	0 13	0 54
Palp	0 02	0 01	0 05		0 06	0 14



TEXT-FIG. 22.—Figs 124-127—*Patu marplesi* n. sp. Fig. 124—Side view, body of male. Fig. 125—Dorsal view carapace of male, showing eyes. Fig. 126—Prolateral surface of male palp. Fig. 127—Retrolateral view of male palp.

**Colour** Entire spider pale yellow, without markings

**Carapace** (Fig 124) Rising steeply from the posterior margin to the highest point about mid-length from where it slopes gently to the eyes Lateral eyes on lobe Clypeus somewhat concave.

**Eyes** (Fig 124, 125) Six From above the posterior row is slightly recurved All eyes equal in width, relatively large, occupying the full width of the eye region ALE separated from each other by a distance equal to three times their width, PME subcontiguous, separated from the PLE by a distance equal to half of the width of an ALE

**Chelicerae** There appears to be a single tooth near the base of the fang

**Sternum** Convex and smooth, broadly obtuse behind where the fourth pair of coxae are separated by twice their width

**Palp** (Figs 126, 127) Short curved embolus present on prolateral surface There is a short stout conductor on the distal prolateral surface and a more blunt lobe and a small bifid tooth on the distal retrolateral surface

**Legs 1 2 4 3** Spines absent Three trichobothria on tibiae of legs three pairs of legs, four on tibia 4 No trichobothria on metatarsi Three claws, tarsal organ basal

**Abdomen** Ovoid, clothed with relatively long, smooth hairs Six spinnerets and colulus

**TYPE** Holotype male Western Samoa, Malololelei, Upolu, ca. 2,000ft, ex moss, January, 1956, T E Woodward Queensland Museum

**REMARKS** This species is separated from *vitensis* and *samoensis* by the ovoid abdomen and the unidentate cheliceral tooth It may be distinguished from *woodwardi* by the different shape of the cephalothorax and the form of the male palp.

#### Genus ANAPISTULA Gertsch 1941

##### *Anapistula australis* n sp (Figs 128-132)

**FEMALE** Measurements Carapace—Length, 0.25, width, 0.22, height, 0.08 Abdomen—Length, 0.38, width, 0.39

	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
Leg 1	0.17	0.08	0.13	0.08	0.16	0.64
Leg 2	0.15	0.05	0.11	0.08	0.15	0.54
Leg 3	0.13	0.04	0.09	0.07	0.13	0.46
Leg 4	0.18	0.10	0.15	0.09	0.15	0.67

**Colour** Entire animal pale creamy white except for a black ring surrounding the eyes

**Carapace** Relatively low, highest behind the eyes, where the height is equal to little more than one-third of the width Lateral margins evenly rounded, thoracic groove lacking

**Eyes** (Fig 128) Four Lateral eyes only present in a contiguous pair at each latero-dorsal margin They are separated from each other by a distance equal to eight times the diameter of an ALE The clypeus is somewhat concave, height equal to slightly more than twice the diameter of an ALE

**Chelicerae** (Fig 129) Vertical, possibly fused at their base There is no trace of a furrow, but with two strong teeth near the base of the fang The fang is relatively short and stout

**Sternum** Slightly convex, as wide as long, truncate behind, where coxae 4 are separated by a distance equal to twice their width Maxillae transverse with well developed serrula Palp lacking

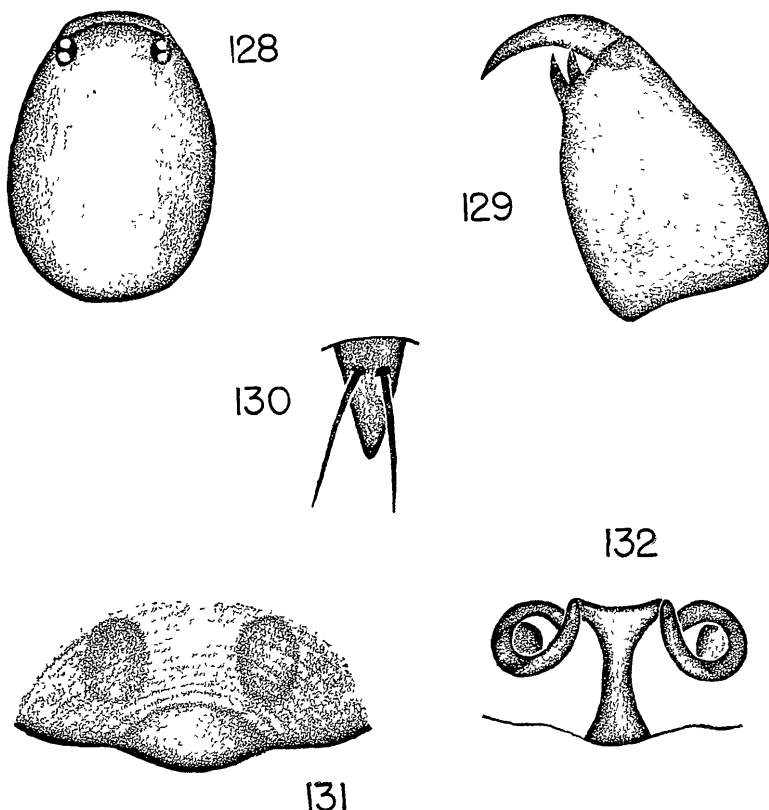
**Legs 4 1 2 3** Clothed with slender, smooth hairs Tibia of all legs with three trichobothria, metatarsi of legs 1-3 with a single trichobothrium, none on metatarsus of leg 4 Tarsal drum proximal Three claws, all of which appear smooth

**Abdomen** Globose, without scutes, clothed with smooth hairs Epigynum as in Fig. 131 Internal genitalia as in Fig 132

**TYPE** Holotype female Australia: S E Queensland, Camp Mountain, ex litter on sand beside creek, December 26, 1956, T E Woodward (Queensland Museum)

#### RESPIRATORY SYSTEM OF THE SYMPHYTOGNATHIDAE

The numbers and placing of the external openings of the respiratory system in spiders has long been used in systematic grouping, but it is only comparatively recently that the internal structure of the respiratory system has been extensively



TEXT-FIG 23—Figs 128–132—*Anapistula australia* n. sp. Fig 128—Dorsal surface of carapace  
 Fig 129—Chelicera of female Fig 130—Colulus Fig 131—Female epigynum Fig 132—  
 Internal genitalia

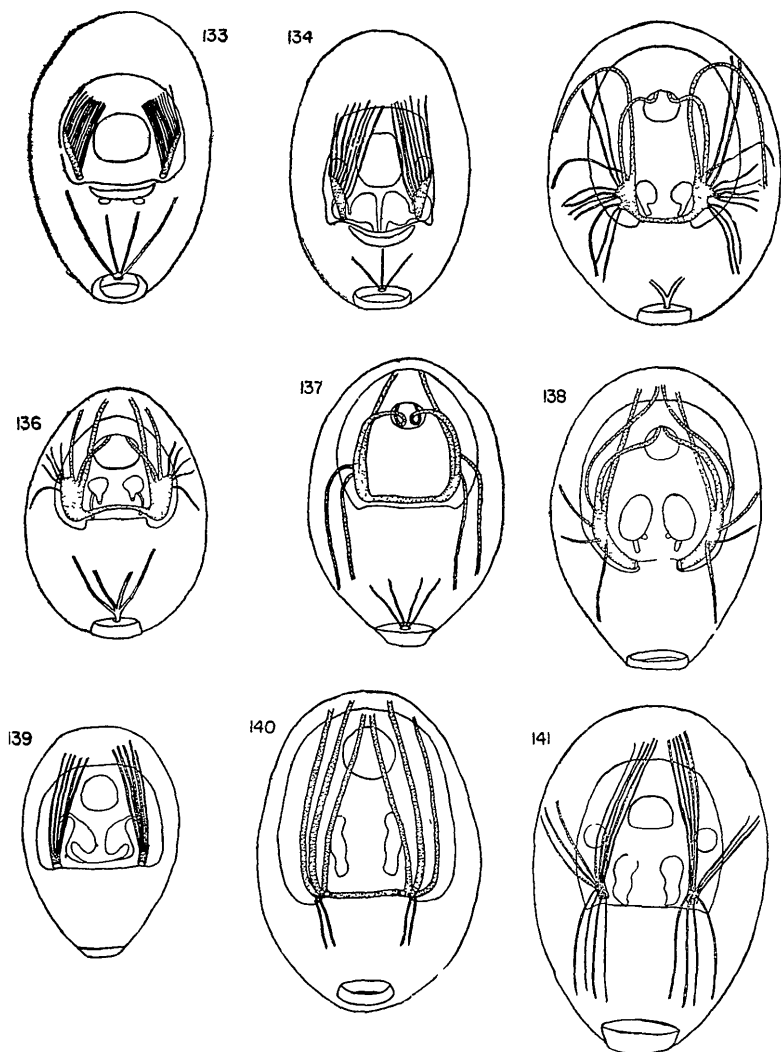
studied and used as a basic character in an attempt to elucidate phylogeny within the order. In 1933 Professor Alexander Petrunkevitch published the results of an extensive survey of both the internal and external structure of the spiders and set out an overall classification in keeping with his findings. The Symphytognathidae he placed with the Caponidae and Telemidae into a separate suborder the Apneumonomorphae. Subsequent authors (Bristowe, 1938, Fage, 1937) have disagreed with this conclusion, maintain that the apneumone families do not form a natural assemblage and group the families with dipneumone families.

The sub-order Apneumonomorphae is based primarily on two internal characters which all these spiders have in common. These are the absence of anterior lungbooks and their replacement with tracheae, and the presence of only two pairs of ostia. The reduction in number of ostia is also found in other families of spiders leaving the absence of lungbooks and their replacement with trachea the only character unique to the three families. It would therefore seem that the only justification for a separate suborder would be if it could be postulated that the loss of the

anterior pair of lungbooks and their replacement with trachea happened only once during the common development of these families. Recent work by Fage and Machado (1951) and Machado (1951) on the Ochyroceratidae has demonstrated that in this family there are genera with a pair of anterior lungbooks and others which are without lungbooks. An examination of the respiratory system of the spiders studied in the present paper in conjunction with the results published by other authors convinces me that a similar situation exists in the Symphytognathidae and that there is little justification other than convenience for placing this family into a separate suborder with the Caponiidae and Telemidae. The difficulty expressed by Petrunkevitch in imagining a sudden change from functional lungbooks to equally functional tracheae is hard to understand. The functioning of the lungbooks and the tracheae of spiders, from the information available, would appear to be similar if not identical. Oxygen transfer is achieved through the walls of these structures to oxygenophylic bodies, which then carry the oxygen to the structure requiring it, a condition in contrast to insects where oxygen transfer is considered to take place directly from the tracheoles to the tissue and is correlated with the absence of oxygen carrying pigment in the blood. The gradual elongation of the lamellae of lungbooks and reduction in the width of the lumen would lead directly to a structure having the form and presumably the function of a tracheal system without any question arising of a hiatus in the efficient use of these structures in the respiration of the spider. That this is in fact what has happened is, I feel, indicated by the structure of the anterior respiratory system of *Risdonius*, *Archerius* and some species of *Mysmena* (Levi, 1956) where it is difficult to decide on morphological grounds whether the structures present should be termed modified lungbooks or a tracheal system. It therefore seems reasonable to assume that the change from lungbooks to tracheae has taken place a number of times and that the change is governed by physiological factors.

The tendency for lungbooks to be replaced by tracheae is of considerable general interest. Davies and Edney (1952) during their study on the evaporation of water from spiders demonstrated that in *Lycosa amentata* respiration took place mainly through the lungbooks, and that tracheal respiration alone was not sufficient to keep the spider alive. If, as might be concluded from these experiments that the lungbooks are the more efficient respiratory organ, it seems surprising that the overall evolution of the spiders indicates a progressive loss of these structures. It is perhaps significant that all of these spiders which we know have lost the anterior pair of lungbooks are small and with the exception of the Caponiidae are in fact minute. It is probable that with the reduction in size and the increase of surface area in relation to body volume, water loss becomes an increasingly important factor influencing changes in the respiratory system because the water loss from lungbooks could be much greater than from tracheae. Most of these spiders are found only in habitats where there is a constant high humidity and are difficult to keep under laboratory conditions for this reason. Furthermore, there is a tendency for many of them to possess sclerotic thickenings and plates on the abdomen which possibly reduce transpiration through the integument.

The respiratory system now known for the species placed in the Symphytognathidae covers a wide range, with a certain degree of uniformity at a generic level. If, as is most probable, the loss of a structure such as the posterior tracheae, the fusion of two spiracles into a single median one, or the change from lungbooks to tracheae, precludes the future reappearance of these structures in their earlier form, it is necessary to postulate an ancestral form which possessed one pair of lungbooks and two posterior spiracles leading into tracheae. The only living spiders which possess this arrangement are those placed in the families Dysderidae and Oonopidae, neither of which show very close relationship when other characters are considered. If, as is suggested in the present paper, these spiders have developed from the Argiopidae or as a number of other authors have suggested, the Theridiidae, then

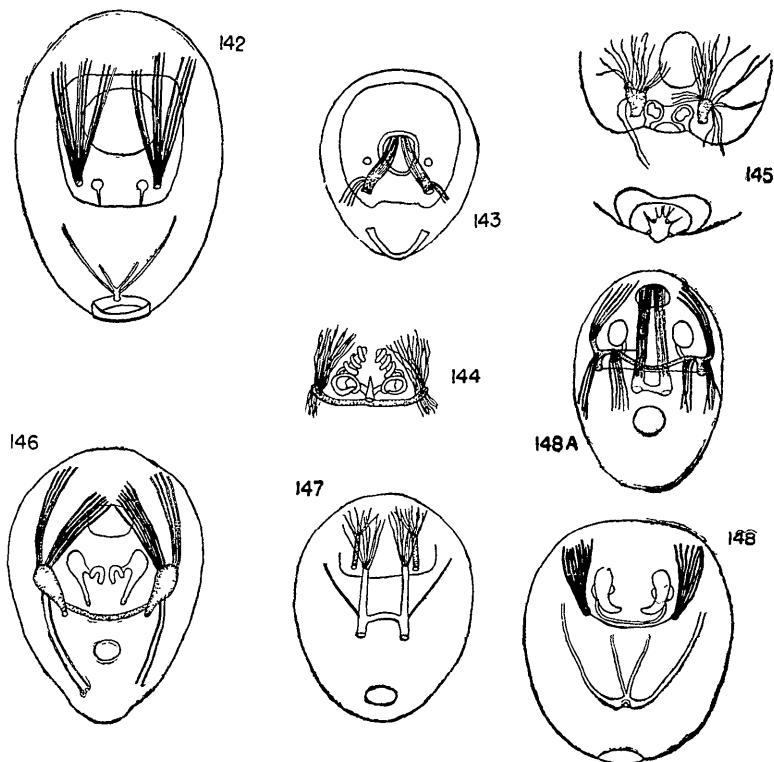


TEXT-FIG 24—Figs 133–141—Respiratory systems as seen from above (anterior tracheae stippled) Fig 133—*Risdonius parvus* Hickman, male Fig 134—*Risdonius conicum* (Forster) female Fig 135—*Micropholcomma caeligenus* Crosby and Bishop, female Fig 136—*Micropholcomma parmata* Hickman, female Fig 137—*Micropholcomma longissima* (Butler), male Fig 138—*Pua novaezealandae* n sp, female Fig 139—*Textricella tropica* n sp female Fig 140—*Textricella pusilla*, female Fig 141—*Parapua punctata* n sp female



we must look for forms within these families which still possess a pair of posterior spiracles. As far as I am aware none has been recorded but this does not preclude the actual existence of such forms either among the smaller known species or in forms at present not known. It would, however, be in no way surprising if this character has in fact been completely lost since the divergence of the Symphytognathidae from the parent stock in view of the number of forms this system takes within the Symphytognathidae and the overall indication that there is a tendency for the two posterior spiracles to merge into one.

*Mysmena* appears to have retained the primitive arrangement more consistently than other genera. *Mysmena guttata* (Banks) and *Mysmena phyllicola* (Marples) possess modified lungbooks, while the two posterior spiracles open into tracheae. In *M. incredula* (Gertsch and Davis), *M. woodwardi* n. sp. (Fig. 147), *M. rotunda* (Marples) and *M. samoensis* (Marples) (Fig. 148a) the anterior spiracles lead into tracheae which are discrete in *woodwardi* but joined by a transverse duct in other species. The two posterior spiracles in all these species lead into atria which are

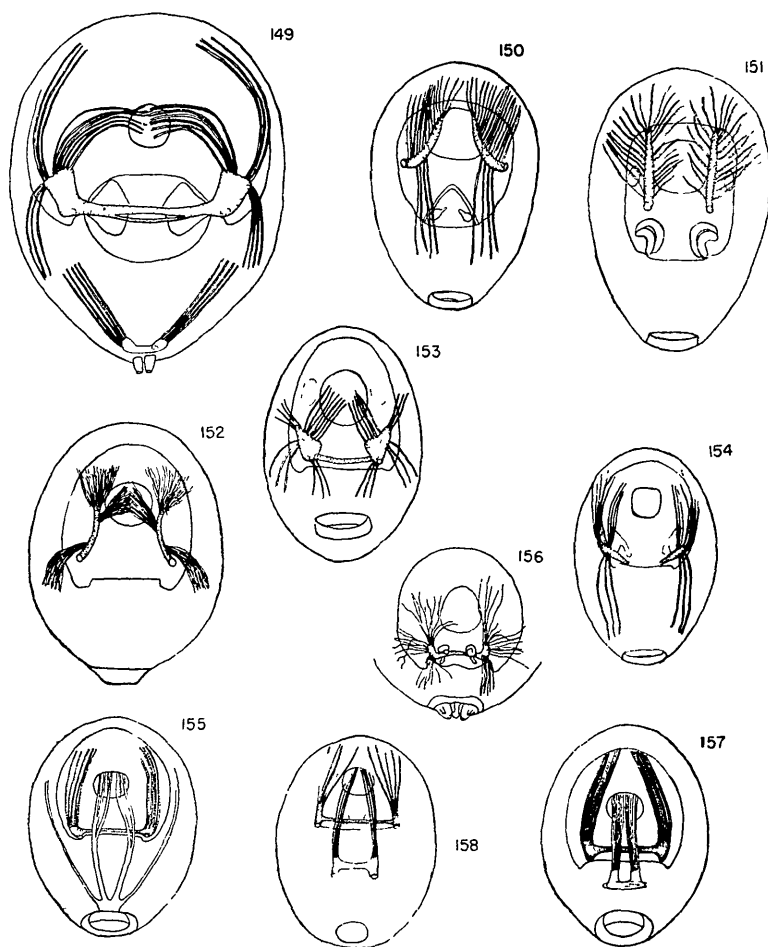


TEXT-FIG. 25.—Figs 142–148—Respiratory systems (anterior tracheae stippled). Fig. 142—*Chasmocephalon armatum*, Forster. Fig. 143—*Chasmocephalon minutum* Hickman (from Hickman, 1944). Fig. 144—*Symphytognatha globosa* Hickman, female (from Hickman, 1931). Fig. 145—*Chasmocephalon* sp. ? Capetown (from Page, 1937). Fig. 146—*Patu* Marples, female. Fig. 147—*Mysmena woodwardi* n. sp. immature female. Fig. 148—*Mysmena vittensis* n. sp., female. Fig. 148A—*Mysmena samoensis* (Marples).

connected transversely and from each atrium tracheal tubes run through into the cephalothorax. In *Mysmena vitiensis* (Fig 148), however, the anterior atria are not joined, and there appears to be a single median spiracle midway between the spinnerets which leads into four tubes, which do not enter the cephalothorax. The general pattern found in *Patu* is that illustrated for *P. vitiensis* (Fig. 146). The anterior spiracles lead into large atria which are connected transversely and tracheae from these atria supply both the cephalothorax and the abdomen. This is similar to the system found in *Symphytognatha* (Fig 144). However, an undescribed species from Poutasi, in Western Samoa, which is undoubtedly a typical *Patu*, possesses two spiracles which are midway between the spinnerets and the epigastric groove as in most species of *Mysmena*. These lead into short atria which are joined transversely, and from each atrium numerous tracheae pass directly through to the cephalothorax as they do in *Mysmena*. The anterior spiracles in *Risdonius* lead into tubular atria which are not connected transversely; from the inner surface of these tubes extend a number of evenly spaced structures which in *R. parvus* Hickman (Fig 133) have the appearance of modified lamellae and have been described as such by Hickman (1939), but which in *R. conicum* (Forster) (Fig 134) are more elongate and tubular and have more the appearance of tracheae. In both of these species there is a single posterior spiracle at the base of spinnerets which opens into a short atrium from which runs three or four tracheae limited to the abdomen. In *Chasmocephalon* the anterior spiracles open into short atria from which tracheae are supplied to both the abdomen and the cephalothorax. In *C. minutum* Hickman (Fig. 143) and an undescribed species from Capetown examined by Fage (Fig 145) there is no posterior spiracle, but in the New Zealand species *C. armatum* (Forster) (Fig 142) the posterior spiracle is present at the base of the spinnerets and this leads into four tracheal tubes which are limited to the abdomen.

The tracheal system of *Anapistula* (Fig 158) is very similar to that found in *Mysmena*. There are two pairs of spiracles; the anterior pair lead into short atria which are connected by a transverse tube, from each atrium five or six tubes extend throughout the abdomen. The posterior pair of spiracles are situated midway between the epigastric groove and the spinnerets and lead into short atria which are connected by a transverse duct while a thick bunch of tracheae run from each atrium directly to the cephalothorax.

Fage (1937) examined the respiratory system of *Anapis hamigera* (Simon) and found that the single posterior spiracle which is placed between the spinnerets and the epigastric groove leads into a short vestibule from which runs two pairs of large trunks. The numerous fine tracheae from these trunks were limited to the abdomen. The two anterior spiracles lead into a wide transverse vestibule which was broken up at each outer margin into two trunks passing through the petiolus to the cephalothorax. In *Anapis mexicana* Forster (Fig 157) the position of the spiracles is the same, but the posterior spiracle is present as a broad slit which leads into a short atrium from which two bunches of tracheae lead directly into the cephalothorax while the tracheae from the anterior spiracles are limited to the abdomen. The system for *Anapisona gertschi* Forster (Fig 155) is similar to *A. mexicana* Forster except that the posterior spiracle is placed at the base of the spinnerets. In *Pseudanapis* only the anterior spiracles are present. *Pseudanapis algerica* Simon (Fig. 156), *P. relicta* Kratochvil (Fage, 1937), *P. octocula* n sp (Fig 152), *P. burra* n sp, *P. insula* (Forster) (Fig 153), and *P. wilsoni* n sp (Fig 154) all have bunches of tracheae passing through the petiolus to the cephalothorax, but in *P. darlingtoni* n sp (Fig 150) and *P. spinipes* (Forster) (Fig 151) the tracheae are limited to the abdomen and the atria are very long and tubular. In both of these latter two species the spiracles have moved anteriorly and open near the petiolus. There is a transverse connecting duct present in *P. algerica*, *P. relicta* and *P. insula*, but this duct is absent from all other species examined.



TEXT-FIG 26—Figs 149–158—Respiratory systems (anterior tracheae stippled). Fig 149—*Lucharachne palpalis*, Krauss, female Fig 150—*Pseudanapis darlingtoni* n.sp, female. Fig. 151—*Pseudanapis spinipes* (Forster) Fig 152—*Pseudanapis octocula* n.sp, male Fig. 153—*Pseudanapis insula* (Forster), male Fig 154—*Pseudanapis wilsoni* n.sp, female. Fig. 155—*Anapisona gertschi* Forster, male Fig. 156—*Pseudanapis algerica*, Simon, female (from Fage, 1937) Fig. 157—*Anapis mexicana* Forster, male Fig 158—*Anapistula australia*, n.sp, female

*Lucharachne palpalis* Krauss (Fig. 149) is also without lungbooks and the system for this species is almost identical with that of *Anapis hamigera*, with the anterior spiracles providing tracheae to the cephalothorax as well as the abdomen. The posterior spiracle, however, is situated at the base of the spinnerets, and appears to have two small openings placed very close to each other, which open into a common atrium. In *Micropholcomma* (Figs. 135, 136, 137) the two anterior spiracles lead into large atria which are joined by a transverse duct. From the atria a number of trunks are limited to the abdomen, but a single pair pass through the petiolus and branch into numerous fine tracheae in the cephalothorax. The single posterior spiracle is situated at the base of the spinnerets and leads into a short atrium from which runs two or four short tracheae. *Pua* and *Parapua* are without a posterior spiracle, but the anterior tracheal system in *Pua novaezealandiae* n sp. (Fig. 138) is the same as in *Micropholcomma* except that the transverse duct is absent. In *Parapua punctata* n sp (Fig. 141) a bunch of five fine tracheae pass through the petiolus in place of the single trunk in the other two genera. *Textricella* (Figs. 139, 140) is also without a posterior spiracle, but the tracheae from anterior spiracles are limited to the abdomen.

The overall picture appears to be one of active change in the form of the respiratory system within the family at a generic level. Only in *Mysmena* does there appear the original arrangement with two posterior spiracles leading into tracheae and two anterior spiracles leading into lungbooks and even in these species the lungbooks are not typical of other spiders. The changes appear to follow a fairly set pattern with, first, the modification of the anterior lungbooks into tracheae, then the fusion of the two posterior spiracles into a single median spiracle, which is then situated posteriorly at the base of the spinnerets in contrast to the placing of the two original spiracles, which are usually situated midway between the epigastric groove and the spinnerets. An intermediate stage is illustrated in *Lucharachne* where the posterior tracheae open from the base of the spinnerets through two openings placed on a common plate. The ultimate form is found when the posterior spiracle is lacking leaving the two anterior spiracles leading into tracheae as the sole respiratory organ. At this stage there appears to be a tendency for the spiracles to move anteriorly beyond the epigastric groove as in *Pseudanapis spinipes* and *P. darlingtoni*.

In most genera tracheae are supplied to the cephalothorax from either the anterior or posterior spiracles, and in no case have tracheae been recorded penetrating to the cephalothorax from both. In eight of the genera examined (*Symphytognatha*, *Patu*, *Micropholcomma*, *Pua*, *Parapua*, *Chasmocephalon*, *Pseudanapis* and *Lucharachne*) tracheae from the anterior pair of spiracles supply both the abdomen and the cephalothorax, but in two species of *Pseudanapis* (*spinipes* and *darlingtoni*) the anterior tracheae are limited to the abdomen. In four of the genera (*Mysmena*, *Anapistula* and *Anapisona*) tracheae are supplied to the cephalothorax from the posterior spiracles and except in *Anapisona* all of the trachea pass directly through the petiolus to the cephalothorax. In only two genera (*Risdomus* and *Textricella*) are tracheae not present in the cephalothorax. The presence in some species of a transverse tube connecting the atria is interesting, and may be found to have some significance, although from the data available at present this does not appear to be so. A similar duct joins the lungbooks of many dipneumone spiders.

The distribution and origin of the tracheae to the abdomen and cephalothorax has been used as a major character in the separation of the families previously placed in the Apneumonomorphae, but it now seems that this has little significance beyond a generic level and can vary within a genus.

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